COSMICS
OF
WORLDS AND FORCES

BABCOCK

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COSMONICS

OF

WORLDS AND FORCES

INCEPTION AND EVOLUTION

OF

STARS

EXTERNAL RELATIONS AND INTERNAL FORMATION

ILLUSTRATED

Astro*mony* not Astro*nomy*

NEWTONIAN THEORY, AS TAUGHT, UNTENABLE

SCIENTIFIC REVELATION

BY

OLIVER M. BABCOCK

Author of "Cosmonics of the United States—a Physical Prophecy of North America," "The Coming Force and the Doom of Steam," etc., etc.: also Member of Advisory Council in Science and Philosophy at the World's Congress Auxiliary and Exclusive Lecturer in the Ethnological Gallery of the Columbian Exposition at Chicago in 1893.

To Imitate Nature is the Highest Aim in Art;
To Interpret Nature, the Greatest Use of Science

MORELL BAILEY
PHILADELPHIA
1901

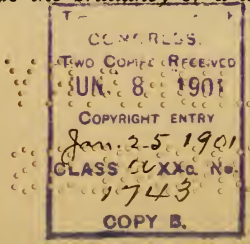
COSMONACROSTIC

Q173
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C COME to your senses and cast all aside
O Of trivial fiction, of nonsense or pride;
S Spew out all error and swallow the truth;
M Manhood must follow the fading of youth.
O On to the future, let past things go bye,
N Never say failure, never say die.
I Improve every moment, conserve every hour;
C Caring for weak ones augments your own power.
S Secure understanding as part of your dower.

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There is nothing sublimer in the history of mind than the lonely struggles which precede and generate success. Every predestined hero will have to demonstrate his superior worth by counteracting and overcoming the most undeserved obstructions. Long before an effective foothold is obtained, he will have suffered most from unexpected quarters and been more aroused by neglect than by timely aid. To opposition is due the brilliancy of a lasting triumph.



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Comprehensive, Demonstrative, Illustrative, Constructive

COSMONICS

Considers All Causes, Estimates All Effects,
Applies to All Affairs and Implies
Apprehension, Cause, Law, Order, Unity, Proof, Application

AND

PHYSICAL PROPHECY,

i. e.

Prediction founded on material conditions, physical operations, known facts, observed phenomena, and all forces (including formative influences on character and hence on community and civilization); a complete unity in establishing conclusions concerning human welfare now and hereafter.

READER.

This book is aimed at errors in schools of learning and popular thought (or lack of thought) on subjects considered scientific. If the views advanced react on the writer he will be amply rewarded in the discovery of his mistakes. He does not claim to be infallible.

The comprehensive title "COSMONICS" implies apprehension, cause, law, order, unity, proof, demonstration and illustration. It is derived from the word *cosmos;* meaning universe—unity in diversity, diversity in unity or all in one—uniformity in Law.

The suggestive conceptions or idealisms employed (instead of assertive conclusions) are an appeal to all for answers which may lead in the direction of some clew to *realities* in place of existing superstitions and imaginations in science and religion.

The object of this work is to inculcate principles rather than to teach facts. Few principles comprehend all facts. Learn the few and know the all. In this age of easy methods, cheap fares, direct roads and quick time; education should also advance.

Inclination; whether inspiration or only aspiration, impels to this undertaking from which it would be cowardice to shrink. That it opposes professional teachings or popular beliefs is not an excuse for withholding conscientious views of *cosmonic* TRUTH.

PROEM.

Truth is the fountain of all good.
Error is the source of every sin.

COSMONISCIENCE.*

Ignorance is absence of knowledge,
As darkness is absence of light.
Education comes after the college,
As daytime is born of the night.

In darkness the roots have been growing;
But the fruits which are nearer the sun,
Have developed long after the sowing,
Or blossoms from buds had begun.

Between them the trunk and the timber,
Made strong by the storms and their strife;
Now no longer a sapling that's limber,
Is a tree that's mature in its life.

Delve not in dark earth for the sources,
Nor seek in the past for the truth;
In modern research find the forces
Of life which is yet in its youth.

The seed and the sapling are vanished;
The tree's in full vigor and strength;
Let the errors of ages be banished;
Reach aloft, for the truth grows, at length.

Then waste not your time teaching terrors;
For wisdom, entreat not the past.
The ages are pregnant with errors;
And time's noblest fruitage is last.

---

* Cos-mo-nish-ence.

PREFACE.

The great Chicago fire occurred on October 9th, 1871. Many persons expressed the belief that the ruins would remain instead of giving place to a rebuilt city.

The author of this work was a resident of Chicago, although absent at the time of the conflagration. He made the calamity an occasion for some lectures in which the future of our country was discussed. Another city employed him to express his views on paper with reference to their bearings on that place, so that the public might be informed of its admirable situation and local advantages for enterprise and investment.

While preparing this booklet many ideas not applicable to that locality came into the writer's mind. Therefore, he determined on writing a work embracing the entire situation, and free from prejudice, partiality, preference or the limitations of local interest; but which would furnish a substantial basis for correct estimates of our country, or any part of it, in all relations of sections, states, cities or localities, and lines of traffic and intercourse each to any and all to every portion of the globe.

Travel, research and study, extending over twenty-one years, 1872 to 1893, eventuated in the production of such a volume, illustrated with suitable maps, original and unique, prepared especially for the purpose. These maps (or charts) enlarged, formed an exhibit at the Columbian Exposition where the books found a ready and extensive sale.

Between 1872 and 1893 the center of its preparation was in Philadelphia. There the plates were made and sent to Chicago where the conception had taken place twenty-one years and nine months before.

The circumstances of conception, and locality of birth and adolescence, together with vicissitudes of growth and advent, is a history of determination, perseverance, association and opposition most remarkable, culminating in a burial for many weeks amid ruins caused by an explosion of natural gas at a leading publishing house in Chicago.

This caused a delay of two months, which the author employed in perfecting an artistic design for a frontispiece—a symbol of empire—composed of elements in the aspects of Nature, which indicate our career and our destiny as a country, a people and a nation.

This beautiful emblem, with its epic explanation, is often declared as alone worth the cost of the book.

This is one of many proofs that seeming disasters in life are often the fertile soils from which come the finest fruits. This book is a child of calamities and a climax of effort.

Its conception in the greatest fire of all history, its birth and evolution in the atmosphere where the identity of lightning and electricity were discovered, its culmination in a calamity in the city of its inception, and its advent at the gigantic Exposition held in honor of a discovery, the subject of which the work essays to expound—*the natural constitution of our country,* and the course of empire, in its march of ages, to its final camp on this continent—is an incident of history

which tallies with other events of these extraordinary times.

Both the great Fire and the great Fair were cosmonic in character and as this work had its inception at the former and its maturity at the latter, with an intervening period of discovery, invention and authorship full of most remarkable vicissitudes, untold as yet, concerning a subject of great notoriety and accompanied by unequaled associations in the progress of art, science and philosophy, both local and extensive, while its own multifarious theme with infinitude of applications diversely treated, forms a composite volume of entertaining educational illustrated scientific business literature of unparalleled worth as a guide for enterprise, investment and speculation; comprehending history, geography, philosophy and prophecy in one sublime subject; it is both cosmic and monistic; calling for the only word expressive of inclusiveness, efficiency and excellence for its leading title; while its comprehensive sweep of all the elements entering as factors into our civilization as a united commonwealth, defines the aim of its production as applying to this country. Hence the title word COSMONICS and the title phrase:

COSMONICS OF THE UNITED STATES.

As it contemplates our future on a material basis and purely physical plane, it is practically a Physical Prophecy.

(See endorsements at the end of this book.)

Principles are involved in this subject which are coexistent and coextensive throughout all known creation, and inferentially through the unknown;

and as they are augmentive, opening into the realms of infinity, the author believes it his duty and his prerogative to continue his explanations to show that all principles are of universal application and, if the study of them be pursued, they lead into deep recesses of hidden truths of great importance to mankind in both scientific and religious investigations.

This thought has become a conviction which constantly deepens and widens the more it is contemplated; and as from a city to the country, the continent and the world, the subject magnified into an attack on other worlds; it continues to grow until it appears to be boundless in reach and ramifications.

Hence this production which, like its predecessor, and all true expressions, first opens the door to a limitless view of the boundless realm of infinite existence. It surveys more than any instrument of mechanical combination of metals and of glass. Its logic is a lens of greater power and accuracy than any artificial contrivance, and its philosophy affords a wider sweep of the universe.

"Where finds philosophy her eagle eye with which she gazes at yon burning disk undazzled?"

Its importance, therefore, cannot be magnified by any power of words, force of thought or power of will. It brings remotest orbs into clearer view than the most expensive telescopes.

This work is an innovation, and may be inconoclastic. It is in line with evolution and will open wider the door of truth as research clears away the rubbish of our

schools and the dawn develops into a brighter effulgence illuminating the new century of discovery, dispensation and intelligence, while cosmonic science leads us into an ultimate unity of all truth in the taproot of comprehensive knowledge.—COSMONISCIENCE.

What is herein taught should be criticized by all readers. The author will be thankful for any exposition of his errors. He regards as his friends those who kindly tell him of his faults. This is not a peculiar trait. It is common to all who love the TRUTH.

It should be understood that as the previous work was without prejudice or bias towards any locality; so THIS BOOK is prepared regardless of race, class, creed, station or sex. The most obstinate resistance is expected from *intrenched* opponents who are in pay-stations and will try to "hold the fort."

The freest man is he who is a slave to truth.
The freest woman is she who is a slave to virtue.

Truth and virtue are inseparable and interchangeable in all essentials—in elements, qualities and characteristics. It follows, therefore, that what can be said of either applies equally to both, and also to the subjects they qualify, as man or woman; and inferentially that in these there is no difference as to rights and privileges in the constitution of NATURE.

EXORDIAL MOTTOES.

"My people are destroyed for lack of knowledge."

"He that knoweth to do good and doeth it not, to him it is sin."

Every acceptance of truth is the opening of another door to salvation.

The acceptance of any truth is a step in the direction of knowledge embracing all truth.

The only way the great problem of the universe can ever be scientifically solved is by studying and arriving at right conclusions regarding the principal element in creation, called *force*.

As the physical is an expression of the spiritual in man, the microcosm; so it must be in the macrocosm, the aggregate existence. Any solution, therefore, of the PHYSICAL problems, is the true course by which to arrive at conclusions concerning the higher spheres of entity.

The objects of this work are to reject error and receive truth, whereby we turn from evil and embrace good for our safety and the salvation of mankind.

"If I seem, with undue enthusiasm, to magnify the principle at stake, the exaggeration—like extreme amplification of the moon's disc when near the horizon—must be charged to that almost necessary aberration of light which distorts every new idea while it is yet climbing to its zenith."

He is a freeman whom the *truth* makes free, and all beside are slaves.

THAT COSMONIC AND SYMBOLIC TREE.

A tree is a type of all growth in organized life and a text for discourse on any number of themes in the realm of thought. It is also a symbol of involution and evolution in the domain of knowledge. The trunk and the tap-root are distinct portions growing in opposite directions—one upward and the other downward—yet they are so intimately connected, interblended and related, that no line of demarkation or point of separation appears. All the branches, below or above ground, are offshoots from the same central or main body of the tree. Roots and boughs are alike as essential to the life of the trunk or main stalk, as they are to the existence of each other. From tiniest root to topmost bough, every spray has its representative at the opposite extremity, connected by a continuous fibre through the great bundle of such fibres—the body of the tree. All are in one, one is in all and the whole is required for a tree—body, boughs and roots. Hence it is a cosmonism.

Knowledge is a tree composed of body and many branches, the great center of which is truth. This is the tap-root and center shaft, or main stalk of the entire growth. Any branch followed in the direction of the mass, leads to conjunctions with other branches, uniting in larger ones until all blend into the main body of comprehensive *truth*.

Truth is the upright and ultimate, the center of all knowledge. Truth is the finality of the law and the law is one, with many branches which we may call facts, all of which agree and sustain the law. All facts coincide and lead to a common goal. A wise man will go in the direction of convergence where facts accumulate. The unwise man shows his weakness by claiming to come *from* the focus of knowledge. By following him, the wrong direction will soon appear in the more and more slender footing on which he tries to keep his balance until he reaches his limit and falls.

In our search for truth we first come into contact with facts which we trace in the direction of their increase, meeting with associate facts which converge toward the same source or tap-root where all seekers will ultimately arrive and in mutual congratulations discover that each is in touch with central truth, and hence in touch with each other.

The experiences of all for the information of each, will result from the world of thought and investigation; from every direction approaching a common center where all branches blend into a harmonious unity.

As in a tree of nature, so in the tree of knowledge; every branch is continuous and entire throughout its most intricate ramifications and intimate associations among its own or associate branches.

Veins and arteries in the human anatomy are distinct, although continuous and coterminous at their extremities; and all merging into or emerging from the heart. As a tree has two systems of branches—roots and boughs; so the channels of blood in the animal economy

have two departments of circulation; one to the extremities, the other to the lungs. So also the system of nerves is double and in two departments: from cervix to brain above and body below. Each tiniest nerve is continuous through ganglion, column and congeries to its counter-terminus at the opposite extremity.

Physiology and anatomy are separate studies and opposite in character; one being functional and the other organic; yet they are essentially one in the animal economy and must be studied in connection.

Geology and astronomy are also, in a sense, opposite studies; but, to be studied intelligently, they must be in conjunction. One is of the earth below and the other is of the stars above. But all are globes; all are spheres;

"All are parts of one stupendous whole."

Earth is one of the stars as truly as is Mars or Venus. So a study of the earth is, to some extent, a study of the stars. Earth is more of a star than is the moon, the study of which also is a part of astronomy.

Learning and education, though interblended, are opposite qualifications, though many suppose them to be the same; but they cannot be pursued separately. One conduces to the other. Learning is the taking in or inducing of thoughts from others; while education is the educing, drawing out or evolving of our own thoughts and a developing within ourselves of the power to think. Learning is a process of involution and educating is a process of evolution. Learning is the most extensive, but education is the most important as a primary possession. Either will follow as the other is

pursued. Learning influences character while education develops it.

They co-operate as essentially as the roots and limbs of any tree. In studying to educate, we learn, and in the pursuit of learning we draw out our energies into power, developing our ability to think. That is education which enables us to emit our own light as a sun; while teaching what we have only learned, is a reflecting process whereby we perform the functions of a moon giving out borrowed light. Hence our teachers are bright according to their education rather than their learning. Besides, the educated—the thinking—man absorbs, assimilates, transmits and evolves thoughts from other sources with a radiance all his own; while the merely learned man utters what he remembers without recasting to his own pattern and hence is not a skillful teacher. He may be a man of talent but not a genius; illuminated rather than self-luminous. Talent only reflects or transmits. A genius is a generator; illustrious in proportion as he is original.

The two elements of civilization called labor and capital are often antagonistic. Their antagonisms may be likened unto a dispute between the roots and the boughs as to which is the tree. They are interdependent and equally essential in the production of commodities which are the fruits of both in co-operation. Wealth is the body of the tree nourished by the circulation between them. The freer the circulation between them in the exchange of opposite functions the greater the tree and the more abundant its fruits. The sap of the tree is its circulating medium. On the free-

dom of circulation depends the character of growth; whether vigorous or stunted. Stint or obstruct the sap and you stunt or dwarf the tree. Sever the stalk and the top withers; but the roots will send forth new sprouts to grow and bear fruit in place of that portion gone into decay. Labor is the life and roots of the tree. It will survive.

Money is the sap of civilization. The more freely it circulates, the more healthy, uniform and beautiful the tree; and the finer its fruits. The more freely labor and capital interchange their functions the better for each and the less in amount is required of the circulating medium. This, however, should always be in proportion to the size of the tree, or magnitude of operations carried on. There should always be enough, and the more active the better. Of quantity there may be an excess.

Elements of earth and air in which trees grow are important factors in the product. Unfavorable conditions cause a forest of inferior timber; perhaps gnarled, crooked, or scrubby; making unsightly what otherwise would be a lovely landscape.

Capital and labor being interlaced and inseparable, they are counterparts, and essential to the existence of each other and of enlightened communities. Without either, wealth would not accumulate; our body politic would cease to exist; social organization must perish; the tree of liberty could not survive and natural—self—government could no longer stand. Self government is a philosophy. When perfected it will be a science.

PHILOSOPHY AND SCIENCE.

Philosophy and science are inseparable from each other or from any branch of either. Philosophy is the root and science is the top of the tree. Art is the trunk, which in every form feeds on both for nourishment, while it connects and sustains them as their medium of exchange and intercourse. Art is comprehensive. It embraces and includes both of the others, forming the trinity of knowledge. Form, proportion, color, and every other factor in art or subject of study, as mathematics, physics, pneumatics, chromatics, optics, music, or logic etc., are philosophic and scientific as artistic pursuits, or studies in conclusive, proved, or exact principles.

Philosophy may aptly be considered the foundation, and science the superstructure, with art as the architect in the temple of truth, or wisdom which is its equivalent.

Philosophy is experimental. It is the love of—inducing the search after—wisdom. In general usage it means the knowledge of phenomena as explained by and resolved into causes and reasons, powers and laws.

Science is *actual* knowledge. It is established. It is past the experimental stage. It is truth *ascertained;* or, systematized and formulated facts with reference to the discovery of laws. It is knowledge classified and made available in work, life, or search for truth.

Truth and facts differ in this: All facts are true, yet not all truth is fact. Truth is infinite. Fact is

finite. All facts have occurred, or come to pass. Much of truth has not yet come to pass, in our knowledge. Whatever may occur is already true. It can not be a fact until after it shall have occurred. Truth forever is. Facts take place at points of time.

Knowledge and wisdom are closely related, but they widely differ in true meaning. Wisdom is the right use of knowledge, which cannot be used until possessed. Wisdom may also be exercised without knowledge — from supposition or conjecture. Knowledge may also be wisely or unwisely used. Discriminations of this character are important in the study of Nature everywhere. Especially important are they in the wonderful and entertaining truths contained in the pages which follow this preface. These embody many thoughts which are new, and reverse many theories which are old and considered scientific or established. They treat of matters philosophic and scientific and in a manner artistic; embracing many phases of knowledge wisely applied, as indicated by the generic or collective term *"Cosmos;"* and suggesting a name, expressive of all subjects, their parts and applications, their demonstrations and illustrations for information, instruction and use of whatever kind by any means employed.

A term so comprehensive condensed into a single word would naturally be Cosmonics. "Cos" meaning unknown quantity and "mon" meaning one or unity in origin, operation or calculation, and embracing past, present and future, touching every interest and all evidence from which conclusions can be drawn. Each conclusion must be sustained by every circumstance in order to be

final and established. The termination "ics" indicates appertaining or belonging to and is the demonstrative or scientific feature of the term or word.

Astronomy signifies classification of the stars. It includes also measurements of size, distance and rate of motion.

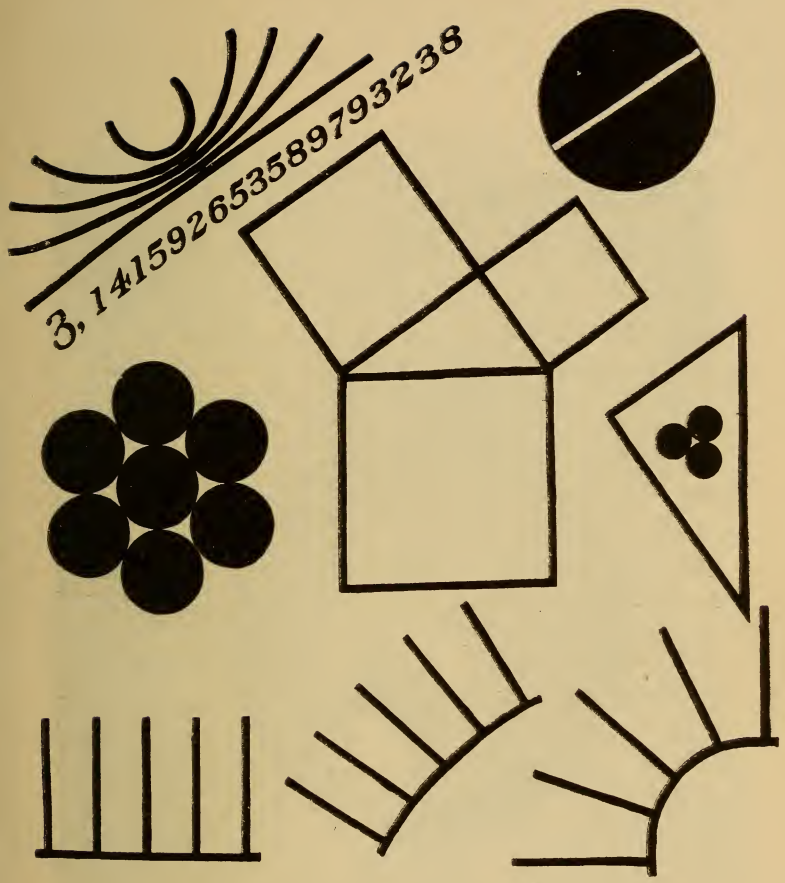
Astromony indicates *unity of laws* governing their growth and movements without reference to dimensions or distances.

Astronomics is the study of exactitudes.

Astromonics is the study of principles.

Both are scientific and philosophic, but the former may be more a science while the latter is more a philosophy. Both, and all their branches, are comprehended in *COSMONICS.*

"New occasions teach new duties;
Time makes ancient good uncouth;
They must onward still, and upward,
Who would keep abreast of truth."

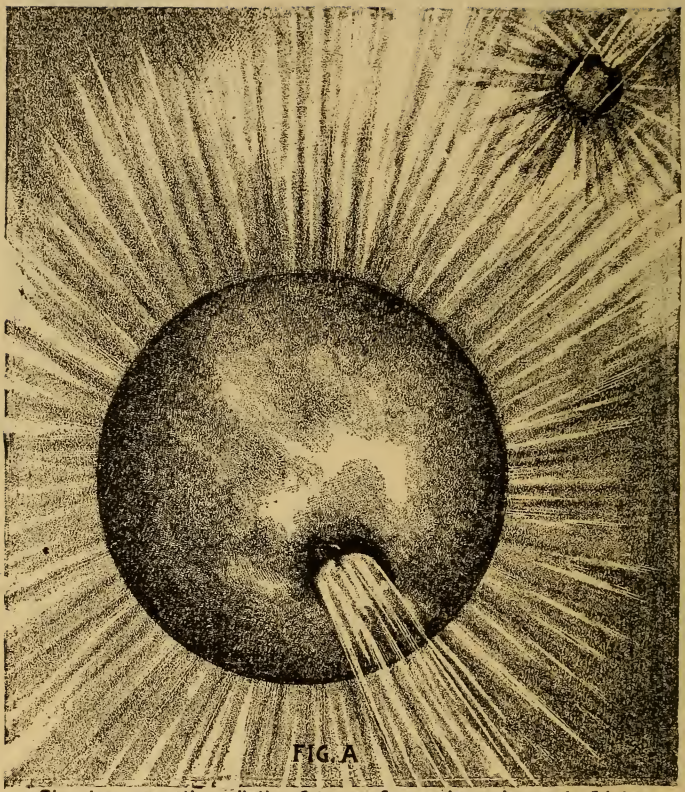


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PLATE I.

UNCREATED UNIVERSAL AND ETERNAL PRINCIPLES.

1—Circles or curves expanded approach straight lines.
2—3, 1415 etc., ratio of any circle to its diameter.
3—Circle or disk, and its diameter illustrated.
4—Center-piece; squares on sides of a triangle.
5—Left hand; six circles around one of same size.
6—Right hand; three balls and any triangular area.
7—Three forms; rays perpendicular to surfaces.



Showing magnetic radiation from surface; also polar vent of interior magnetism causing northern light; also moon's polar vent.

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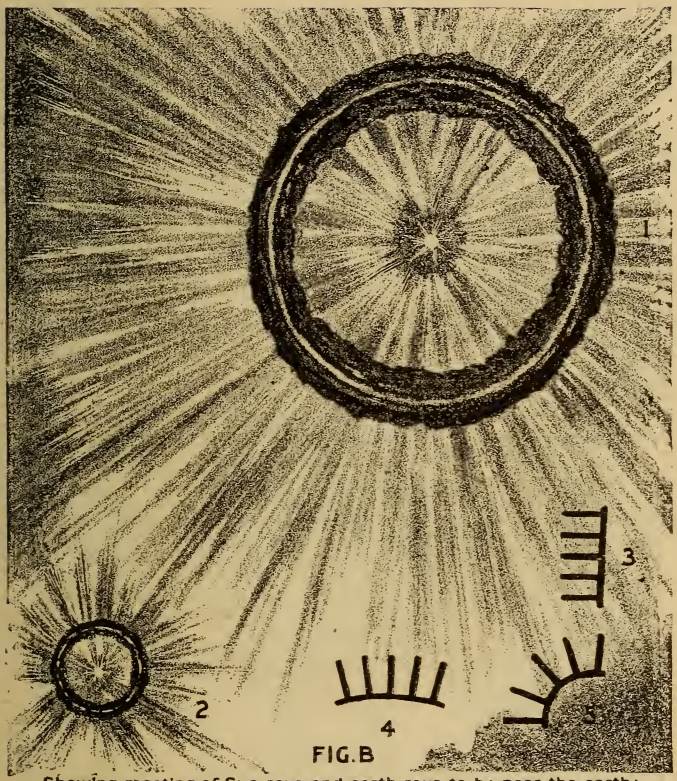
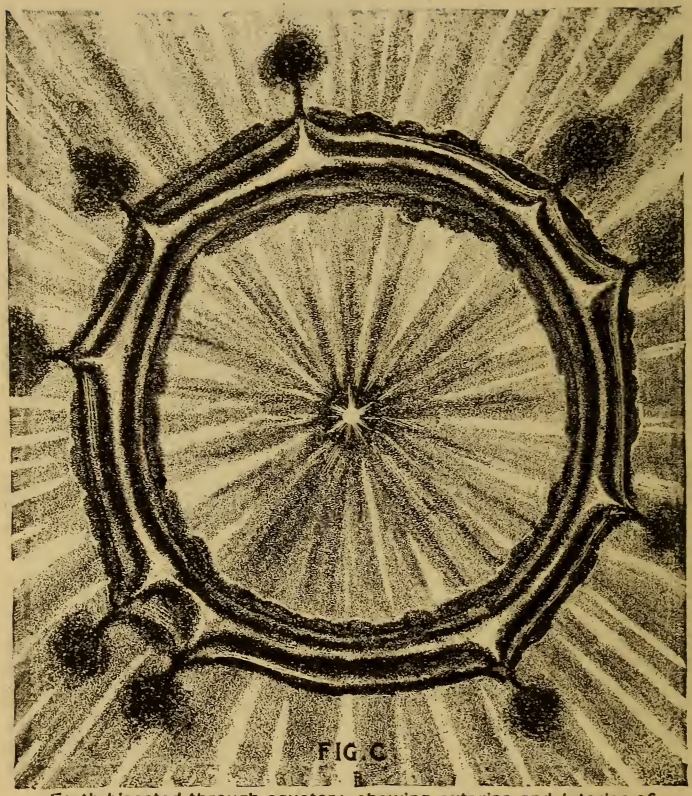


FIG.B

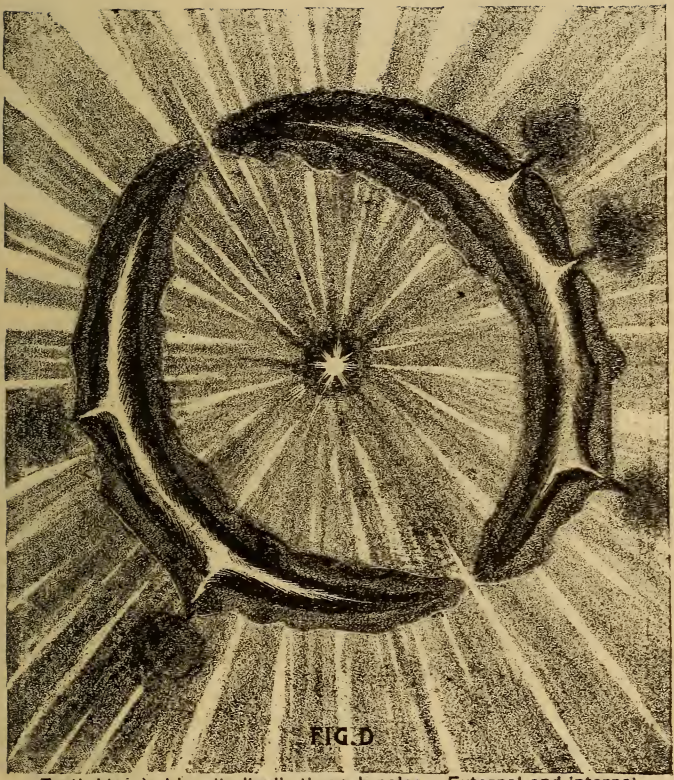
Showing meeting of Sun rays and earth rays to be near the earth; also lava beds of both spheres Volcanoes not illustrated in this figure. 1 Sun. 2 Earth. 3, 4, 5, rays from straight and curved surfaces.

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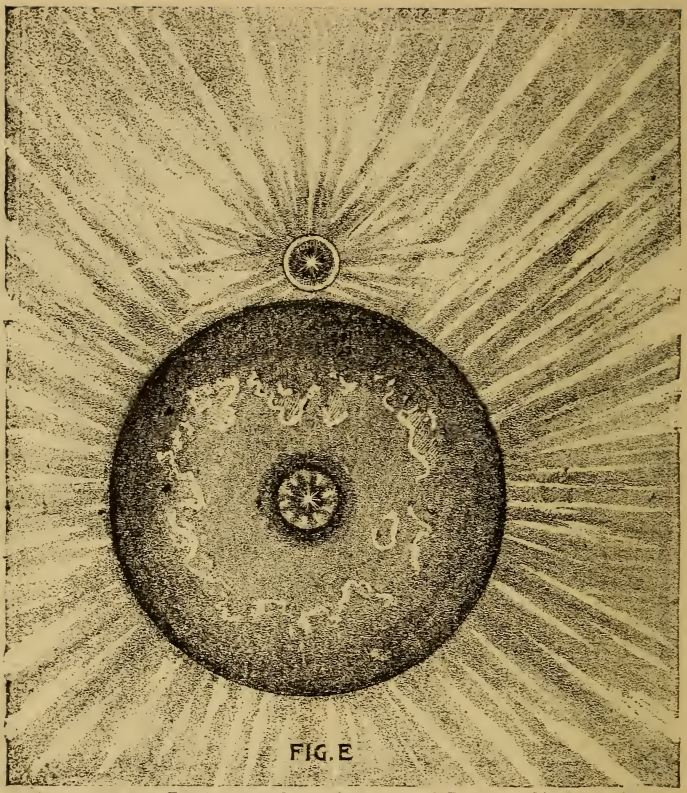
Earth bisected through equator; showing exterior and interior of earth crusts with intervening lava bed; also exterior and interior magnetic rays and exterior volcanoes. No internal eruptions.

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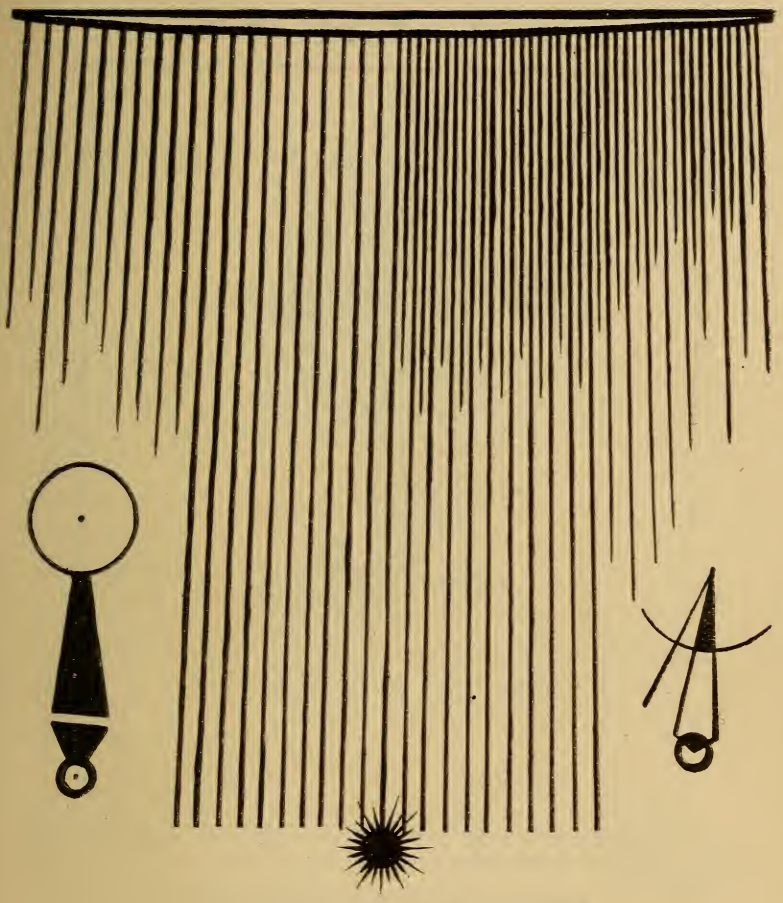
Earth bisected longitudinally through poles. External and internal magnetic rays from outer and inner crusts; also intervening lava bed.

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Near view of Earth seen from direction of Polaris: Shows polar opening — North Pole — with Sun in summer. Similar appearance near South Pole

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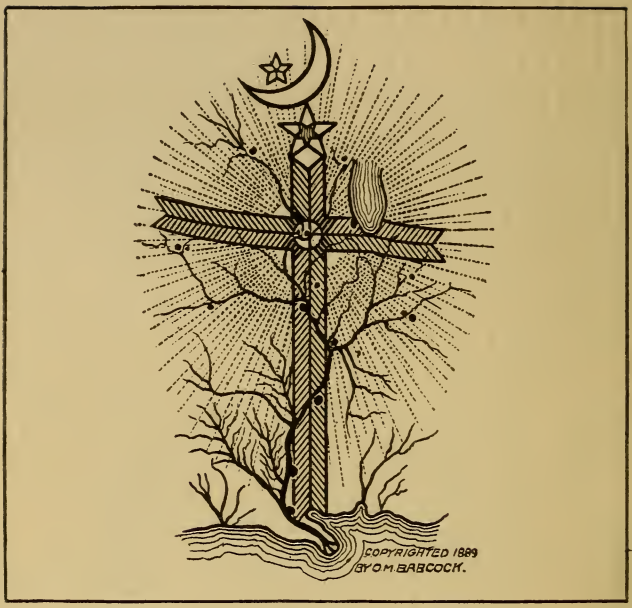
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PLATE 7.

COMPARATIVE SIZE AND CURVATURE OF EARTH AND SUN, SHOWING DIVERGENCE AND PARALLELISM FROM SURFACES; ALSO TWO SIDE ILLUSTRATIONS OF SAME PRINCIPLE. SUN CURVE, TOP; EARTH, BOTTOM.

RIGHT HAND, EXPANSION FROM BOTH CENTERS AND SURFACES.
LEFT HAND, EXPANSION FROM DIFFERENTIAL SURFACES ONLY.

CIVIC CROSS.



EMBLEM OF EMPIRE.

A SYMBOL AND SIGNAL OF

CIVILIZATION

Developed in concealment from remote antiquity and being carried forward with undeviating unity of purpose to culminate on this continent where, from an eminence hitherto unreached, the readers of

Cosmonics of the United States

survey a scene of coming grandeur, surpassing in reality anything recorded in the shadowy realms of romance. This unique figure has a wonderful significance entirely apart from any religion.

Many persons, however, attribute its mysterious production to inspiration and regard it as having a marvelous meaning beyond the intention of its author. Its features are founded in the aspects of Nature and indicate our political, commercial and industrial order in development. It is portrayed in beautiful colors and fully explained in Cosmonics of U. S. See adv't in back part of this book.

COSMONICS OF WORLDS AND FORCES.

INCEPTION OF EXISTENCE.

SPACE is the prime essential of existence. Anything or any idea of a thing independent of or apart from space is impossible. This positive truth is also a primary concept. Mind cannot comprehend any condition or operation aside from space. Unlimited space is, properly, *Immensity.* Neither height nor depth nor direction pertain or can apply to space as a whole. They are only relative to some locality or object. Uncreated, infinite, unmovable and eternal; Space, although a nonentity in concept, is the only reality, save one, which the mind or soul can imagine as primary, persistent, unchangeable and free.

UNITY—absolute oneness—indivisible wholeness without number, dimension, degree or situation; without kind, variety or adjacency; precludes all possibility of description or explanation of space. One is the only perfect number.

TIME is the comprehensive, unlimited and illimitable concomitant and complement of space. It is comprehensive and incomprehensible duration. Beginning or ending is not possible, except with reference to periods

or events; and then only in relation to material objects. From everlasting to everlasting—no beginning to no ending—one eternal, ever present *now* is all that can be perceived of that measureless and essential condition of all existence—time. Its proper name is Eternity.

MATTER is the cohered succeedent of space; coincident with and coefficient of time; and, although coexistent in its essential elements, is the direct opposite of space, in all perceivable properties. It is possible to conceive of space without matter; but we cannot entertain an idea of matter aside from space; and we cannot conceive of either without that other element essential to all existence—time. These three constitute the trinity of every known possibility.

Omnipresence inheres in space; perpetuity in time; and limitation in matter.

Space, being omnipresent, cannot be moved, as there is no whither for it to go. Matter, being limited, is movable in space. Time is essential to all changes of matter in space.

Space and Matter are opposite requirements, and extreme in all the potencies of their creative and governing functions; while Time seems to be the intermediate essential, and forever the exact and exacting accountant and observer of all that occurs—the ever just recorder—the discretive element of existence!

Space and Matter possess the passions, or active principles, from which life and motion emanate. Each possesses, or is possessed by, a passion for the other; this appears to be a condition to which all passional affinities are adjusted. Together they express the laws

under which all such affinities are executed or manifested.

Space never moves but is always ready to receive. Matter always moves towards least occupied space, or in the direction of least resistance; although this fact is not always plain to human observation. Figuratively, the arms of space are always open and matter forever seeks their embrace.*

Space is the matine or negative primal principle, and matter is the maline or positive primal principle in all action. Emotions and operations always conform to the law governing space and matter in their apparent fondness for each other. Opposites are always embracing to bring forth newness, which gradually assumes one or the other form or quality, only to again embrace its opposite and complete the process as before.

Space, as a word, is used variously in a limited or unlimited sense. Ordinarily it implies limit or measure of expanse or extension. It is here employed as the best name for our idea of unlimited extent of room in which matter in all its forms may move or exist.

Time is here used as the best word by which to designate endless duration; although in strict application, or technically, time is only a measured part of duration or eternity.

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* The genitive passion between space and matter cannot be understood, much less explained, at least by any phraseology now in vogue; and if ever accomplished, a vocabulary must either grow or be invented for the purpose.

It is not worth while to write more than will be read, and any attempt to explain what is beyond the reach of the rational, is in vain.

IMMENSITY and INFINITY are words which apply respectively to space and time, where endlessness or unlimitedness is to be expressed. Both terms, however, may be tentatively used in reference to matter.

Space being motionless and immovable while matter is both movable and motile, all motion is manifested by matter. A condition of motion inheres in space, but without any manifestation by it.

Of space, therefore, we may say that its attributes are omnipresence and oneness; its passion is electrical receptivity, and its characteristics are persistency, permanency, comprehension and composure; while phenomenally it is capacious, universal, equilibrius, dark and cold.

Of matter it may be said that its properties are limitation and motion; its passion is magnetism and fervency with characteristics of consistency, divisibility, velocity and vibration. Its phenomena are occupancy, distribution, position, solidity, fluidity, heat and color. Other terms might be added but these will suffice.*

These three prime essentials, Time, Space and Matter, comprise all there is on the material plane. Any other plane it is not our purpose here to discuss. A super-material substance or essence we may not admit

* Many questions will occur to the reader, but it should be borne in mind that we are dealing with immensity, infinity and eternity, concerning which, if all were understood, the life of one person would not be sufficient to either write or otherwise express it.

Orderly statement is better than elaborate argument; and a discussion of questions unanswerable would be equally unprofitable, in view of the vast number possible of solution

or deny, but we may lay foundations on which to build inferences and rest theories concerning them. We are in the domain of the physical; and whether or not any phenomena be attributable to super-physical causes, the supernatural is not here admitted. It may be considered later; but the physical in its various requirements, entities and operations needs no supersensuous plane for its most extensive elaboration.

At our present stage of knowledge it is not possible to determine whether there is any form or substance above the material, for this exists in such a high degree of tenuity, or sublimation, that it seems to supply all the conditions and answer all the requirements of the spiritual state. Whether matter be concreted spirit or spirit be sublimated matter, is unprofitable to discuss in this connection; it being non-essential and impossible to determine.

If what we have discovered be a law governing all known matter, the same law must prevail in the unseen and unknown. A missing link between the known material and the unknown so-called spiritual may yet be ascertained.

Every truth is universal in application and cannot conflict with any other truth; for all truths are in harmony. Errors are ever at variance with truths and,

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and equally important, which must be omitted in a work of this magnitude.

Ideas are born naked; often long before they are clothed or carried by words, or a market is found for their profitable exchange. In the absence of appropriate vehicles for their conveyance or expression we must use what can be temporarily employed for the purpose.

besides, are always quarreling among themselves. Every theory, therefore, which is in harmony with any particular truth, must be supported by all truth, and is necessarily true.

Analogy, therefore, is reliable only when in harmony with truths already known—which right observation and experience maintain. Without these any safe analogy cannot be drawn. What we know of conditions under which objects exist and operations occur, affords a substantial basis for conclusions concerning things beyond the domain of sense. (Rom. 1, 20.)

A straight line being the shortest distance between any two points now and here, must be so always and everywhere. A truth on earth must be a truth on every other sphere. Length, breadth and thickness being the dimensions of matter on one planet, must be so on every other. The smallest number of straight lines that can bound an area is three, forming a triangle; and the fewest number of supports that are self-sustaining is three, as in the tripod. Three balls, each touching the other two, will always give the same form however they may be shifted. These typical truths together with what has been said of space, matter, time, etc., suggest the supposition that three is the basic number and that the triple order prevails throughout Nature; as in the human brain we have the animal, the mental and the moral; or the social, intellectual and ethical. The inference, therefore, is rational that all material existence is founded on the trinal principle and that all abstract truth is in correspondence therewith. (See Plate 1.)

Dimension, form and number are concepts aside from

any idea of space or matter; and yet it is impossible to perceive their existence apart from space, or their expression without the employment of matter. The three are separate, abstract and eternal principles; each infinite in variety, distinct in elements, exact and accurate in every quality of its existence, relation and manifestation—limited, like matter on which its expression depends, yet infinite in all the relations it bears to space; while the relations they all bear to both are approximate; that is, these relations are definite, infinite or approximate and so partake of the nature of space or matter according to these relations.

The foregoing statements or assertions will be made clear by a few illustrations.

In relation to space a straight line is indefinite and infinite in its only dimension—length. In relation to matter and sense it is definite and finite; for it is then manifested and not imaginary. A definite (or finite) line has two ends or points of termination. A line with only one terminus is partly definite and partly infinite. It may then be considered approximate. As a line cannot extend beyond space it must be comprehended in space. Imagine an infinite straight line, i. e., having no end; then suppose it severed at some point, creating two ends. In such a case each imaginary line has only one end and is neither definite nor infinite as a whole, but it approximates both.

Again: the greater a circle or curve the more it approaches a straight line (Plate 1); yet, though infinitely enlarged it will not become straight. The smaller a ring or circle the nearer it approaches a point; yet,

while it remains a circle it cannot become a point; for when contracted to a point it is no longer a ring. The ring or circle then, although a symbol of eternity, may be regarded as an approximate ranging anywhere between the definite and the infinite—between a straight line and a point.

"Scientifically," the circle is often said to be an "infinite angle" or a "constant angle." The degree of the angle having never been given, the question is open for any mechanic or mathematician to answer. The larger the circle the more obtuse the angle, while the smaller the circle the more acute the angle. Therefore, when may the circle be said to approach the straight line, and when approach the point? When approach the infinite and when the finite? Evidently when it passes the halfway position between the line and the point.

When the circle is a 45° curve it is the midway arc. When more than this it may be considered as approaching the infinite; when less, the finite; or, when more, approaching the line; when less, the point. The proximate principle may be represented by a diagonal, midway between the horizontal and its perpendicular. When a 45° circle shall be defined, the medium between the finite and the infinite will have been established.

Another illustration of the approximate is plainly given in the ratio of a circumference to its diameter. Both may be exact in separate measurements, yet the ratio or the exact proportion between them cannot be found. The same figures express the approximate ratio of all circles of every size. As the decimal is extended the ratio is approximated but exactness is not reached

by infinite extension. This is an expressive symbol of infinite expansion of the human intellect without reaching its limit or comprehending infinity. The unsolved problem of squaring a circle is another illustration of infinite principles.

In motion also, as well as in dimension and form, the principle is illustrated. For several years controversies have been carried on in the papers, concerning the difference of motion between the top and the bottom of a carriage wheel. Many and widely extended comments, called arguments, have been advanced on this very simple subject. The question might as well be asked: How much faster does a man move by walking than by standing? Or, again and variantly: What is the ratio of difference in the rate of movements of two men, one of whom is moving at the rate of six miles, and the other at only three miles an hour, and a third man who is not moving?

There cannot be a ratio of movement between two bodies when only one moves. If both move at the same rate there is no ratio. Any argument about a ratio in either case, is useless. When both move at differentiated speed there is a ratio. The nearer to the same speed they move, the less the ratio and the more the difference the greater the ratio. In the former the finite is approached and in the latter the infinite. One may represent the point, the other the line, approximately.

In like manner is the carriage wheel problem solved. The bottom of the wheel, being stationary, represents the standing man, while the top of the wheel represents the rapid mover, and the hub represents the slower.

The bottom of the wheel—the part on the ground—may represent a point while the top represents—or is represented by—a straight line.

For all purposes of estimating, the bottom of the wheel must be regarded as motionless, and therefore without any ratio of motion between it and the top or any portion of the wheel above the bottom. Whether the wheel move swift or slow, the ratio is between moving parts only. The swifter the carriage moves the greater the ratio between the moving parts of its wheels and the slower it moves the less this ratio; and the farther apart any two vertical portions of a moving wheel, the greater the ratio at any given speed. The swifter it moves the more nearly this ratio approaches the infinite, and the slower the motion the more nearly it approaches the finite.

But neither the infinite nor the finite is attainable by either the swiftest or the slowest motion. They can be only approximated, and while there is motion. Even were the wheel a thousand years in moving an inch the finite of ratio is not reached. This conveys a faint idea of the infinitely proximate in motion, as well as in dimension and form, without reaching either the finite or the infinite.

Were the carriage stationary and a wheel resting on its axle instead of on the ground, then when turning on the center, all sides of the wheel would move equally; but when resting on the ground, the bottom, at point of contact, becomes the axis of motion and itself is practically motionless. Hence there can be no ratio between

it and any elevated portion of the wheel as far as motion is concerned.

Again, if one wheel be lifted from the ground and supported by the axle, even though the vehicle be moved rapidly forward on three wheels, the bottom of the wheel, if turning, might be moving backward while the top of the wheel would be moving forward, and vice versa; and with a ratio of opposition between real and relative motion in proportion to the speed of rotation. But if the wheel rotate very slowly, while the entire vehicle moves rapidly forward, the top of the wheel (or even the bottom) would be really moving forward while relatively moving in the opposite direction. This conveys clearly the difference between real and relative direction of movement; and should be closely discriminated in order to perceive what is described on these pages in reference to sun, earth and moon.

Much more on the wheel problem could be said in illustration of the finite, infinite and proximate; but is omitted in order to bring forward, and within proper limits discuss, momentous truths concerning the great law of energy, force, power and motion.

A ball or hoop thrown will, on striking the ground, continue in the direction in which it is cast, or will return toward the projector, according as the ratio of its momentum differentiates in favor of the projectory or the rotatory motions. If the projectory motion be greater it will continue to roll in the same direction, and with increased velocity if the top of the moving body be rotating in the same direction; but if the bottom be rotating in the same direction while the top is

turning backwards, and with a momentum greater than the entire forward movement of the mass, then when it strikes the ground it will begin to return, and with a speed proportioned to the excess of rotatory over projectory momentum. If the two momentums be equal, the object will suddenly come to rest.

If a cannon ball or a bullet be so fired from a rifled barrel that the peripheral particles of matter move with a circular speed equal to the forward movement, the friction on the object reached will be at a diagonal of forty-five degrees, the most effective angle for execution.

These problems illustrate the infinity of diversification admissible in arguments on many of the great problems for investigation; and prepare the way for meeting difficulties which prevent us from arriving at conclusions that involve accurate calculations. It is impossible to calculate with accuracy the ratio between the earth's mass momentum in its orbit and the rotary momentum on its axis—or the velocity of the two; for the whole moves with approximate equality through space while the axial speed is infinitely varied between the equatorial and the polar peripheries or any axis of motion; and this variation, although exact between surface and center (if center be the axis) at any given parallel, is infinitely differentiated on the surface between equator and poles because of the spherical form. Besides, the uneven surface made up of hills and valleys would alter any approximate calculation.

The axis of the earth's rotation may remain forever an unsolved problem. The axis, like that of the running carriage wheel, may be on one side or between that and

the center. It may even be away from the earth altogether, as we shall see farther on. (Pp. 69 and 89.)

Many interferences, as yet undiscovered, will change estimates now made, on which are founded much of teaching in our schools.

Discoveries recently made indicate that the differences observed in the spectra of the stars are not caused by differences of temperature as has been generally believed, but show differences in atmospheric composition. It is also now known that in our system are a total of eight major, four hundred and thirty-two minor, and twenty-one satellite planets, four hundred and sixty-one in all, against seven, including the sun, which the ancients knew.

The following pages will show at what wide variations from rational conclusions—from truth—our lessons have been taught. Theories must be reconstructed as we ascertain the fundamental principles of absolute knowledge. In the pendency of transition from false to true, teachers and preachers will continue to thrive on the credulity of people who are too ignorant, or too lazy, to think for themselves.

Error is the prolific source—the fountain—of evil which has for its root the love of money; and millions of learned men and women pursue their craft for money, while conscious that they are dealing in false or, to say the least, uncertain views of life, both here and hereafter.

Energy is back of all force and force is behind all power. Energy, force, power, are together in the function producing motion. Energy is potentiality not in

action. Force is energy in action. Power is force overcoming resistance. Motion is effected power, and is manifested when observable to human sense.

Energy, force and power constitute the trinity connecting primal cause with ultimate effect.

Neither energy, force, nor power is ever seen. Motion is the manifestation of this trinity of action. Without resistance motion would not occur, power would not be produced, force would not be exerted, energy would not avail.

Restraint, resistance or obstruction is a condition of any effect. The finites, proximates and infinites that we have mentioned, plainly indicate our narrow limits of knowledge and our long distance from the absolute. It is not worth while to hope that we shall ever produce telescopes or microscopes which shall extend our vision to the ultimates. We may not reasonably hope to ever see a single separate molecule, much less an atom. How then are we to know interstitial ether or that still remoter state of matter, inter-etheric substance?

When we aim our telescopes at apparently vacant space, and see no stars and yet find that on a sensitive-plate, behind the telescope, rays proceeding from beyond our ken, bring to us the photographic intelligence that stars are there, it is time for us to think of our infinitely sublime capacity of intelligence associated with our finite physical smallness; and wonder if there is even a proximate ratio between this finite body and the infinite soul which inhabits it as a residence of matter occupying a point of space for a moment of time; to then be liberated into a limitless life in an infinite eternity.

These views more than intimate the boundlessness of all beyond human scope; at least until man is fitter for a range of knowledge vastly wider than he can hope to possess while in this tenement of brief existence. He may not reach above the denser atmosphere, penetrate beneath earth's crust, or explore the center of its polar zones.

For ages to come his researches may be confined among the finites, or soar into, but not beyond, the proximates.

The very contracted view held by a vast majority of persons concerning the stupendous and beautiful universe (and hence their extremely small apprehension of its creation and control), is discouraging to those whose dreams by night and thoughts by day are of plans for elevating above the plane of sense and sordid ambition, those who labor to possess only that which adds nothing to the intellectual wealth and moral grandeur of comprehensive man.

To the investigating intellect there appears a delicate and indefinite shading of presence into absence, matter into space, something into nothing. This infinite blending seems to be an inappreciable reality; a proximate quantity, too fine to be defined, explained, or comprehended.

Between the extremes (and apparently independently of them) are the abstract quantities: form, dimension and number, infinite in variety and extent, constituting a trinity other than time, space and matter; aside from any one of them, yet requiring all three for any expression or manifestation.

The interesting problem of Euclid represents them all; constituting a great central and interblending truth, uniting as it were, the infinite and the finite in one exact, practical, tangible demonstration. Any right angled triangle of whatever proportion or size, proves the same uncreated, self-existent, eternal truth: The square of the hypothenuse equals the sum of the squares of the other two sides. See Plate 1.

Here dimension, form and number are employed. Dimension and form are the principles, while number is the registrar and serves the same purpose performed by time in relation to space and matter.

We have then the trinity of trinities; form, dimension and number in relation to space; solid, liquid and gas in relation to matter; and past, present and future in relation to time.

Six circles of any size exactly surround a seventh of the same size. Figures of six flat equal sides will do the same, like the honeycomb in its economic arrangement. Quartz crystallizes after the same pattern. Does intelligence form the comb and not the quartz crystals?

All truth must be invariable. Are these truths, laws and principles created? Did they ever have a beginning? If so, what preceded them? If not created they must be self-existent and indestructible; hence eternal. If this be heresy, what is the accusation and who is the accuser? Let the plaintiff show himself and his cause.

Principles cannot be otherwise than omnipresent and everlasting. Observed laws operating now must operate also at all times and everywhere. The great law of energy and its operations cannot have exceptions.

The three basic dimensions, length, breadth and thickness, exist both in fractions of space and in bodies of matter. They all pertain to the cube. Each cube has twice as many sides as it has dimensions, twice as many line corners as it has areas or sides, and twice as many line termini as it has line corners; all multiples of three. Three lines focus at each point making twenty-four termini of lines; again multiples of three, there being eight point-corners.

These eight point-corners indicate eight fundamental principles from which all conditions of existence proceed. Given in pairs or dualities and classified in their antithetical or opposite relations, these are as follows, namely:

SPACE AND MATTER, OMNIPRESENCE AND LIMITATION, PERSISTENCY* AND CONSISTENCY,* CONTINUANCE AND DIVISIBILITY.

A circle may also be said to have three dimensions: the diameter, the circumference and the degree of curvature. The last mentioned determines accurately the other two and, approximately, the measure of a subtending line. It is the proximate factor. Illustrations almost innumerable might be given.

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*Con=with; together. Per=through; by. Sisto=to stand or cause to stand. Consist=to stand with or together. Persist=to stand through or by. Consistency=holding together; remaining in a fixed and permanent state; a state of rest. Persistency=standing fast and firm in pursuit of a purpose undertaken; continuity. Space is continuous and therefore persistent. Matter stands with or together and is therefore consistent.

THE TRUTH ABOUT THE STARS.

It is well known that sunlight on the earth is more intense in the morning than in the evening. This fact is not accounted for in any book hitherto issued; nor has the author of this one ever been able to obtain an explanation from any learned professor or scientist. When lecturing he has often appealed for a solution, but always without success. Yet the solution is very simple. It needs but a moment of thought. Earth turns eastward, opposite to and meeting the morning rays; but moving along with the evening rays; i. e., in the same direction. So, the eye and all other objects resist light vibrations more intensely, as well as receive more of them, within a given time, in the early portion than in the after part of the day. The contact of rays is vitalizing—energizing—in proportion to intensity and frequency of the vibrations. Hence, thought-energy is keener, and logic as well as learning is more successful in the morning; while the lesser light of evening is more suited for love, poetry of emotions, and repose.

Were the earth stationary, with the sun moving around it, these effects would be practically the same. The principle would also apply to heat, but for the fact that having cooled off during the night, the heat is absorbed more quickly in the morning than afternoon when the warmed earth and objects which are on it, by reflex action help to intensify the effect called heat.

To human sense the operations of nature are illusive,

and erroneous ideas are largely the outgrowth of these physical illusions. The sun and moon appear to rise in the east and set in the west, when it is we who rise and set in the opposite directions. It may yet be ascertained that instead of spots on the sun, satellites passing across its disc, or between it and us, produce the effects which have so misguided our conjecture. Our hair and our nails appear to grow at the outer ends, when in fact the growth takes place at the inward end—the roots.

Our senses give to us the impression that they recognize by outward action, when the reverse is true. Our eyes do not send forth energy, force or instrumentality of any kind whereby we see. Sight is an influx. Inflowing rays convey to our brains impressions according and peculiar to the nature of objects visible. The qualities of color, consistency, texture, etc., are conveyed by the light rays telling us what is the character of things we see. Sound, also is an approaching influence (in-flowence). The same is true of smell, taste and feeling. All are inflows. Clairvoyance, telepathy, and all transference of thought are under the same law.

Our faculties are always at home, and they receive many visitations from individuals and objects which often are far away. We never go away from our bodies after them but, as with physical sight when we turn our eyes in the direction from which light comes in order to see, while the organs never leave the body, so in clairvoyance, or any form of mental vision; rays proceeding from objects we would see, through the etheric medium, impinge on the sensorium of a receiving brain, bringing in some very mysterious and wonderful impressions as

the properties of objects from which they come. Probably physical science will never solve this problem. Some superscientific revelation may tell us the secret. Of one truth we are approximately certain: Analogy is quite assuring that our thought-waves produce their effect on others by *inflowence* at the termination of their journey, and not by *exflowence* at its inception.

Human and other animal bodies emit exfluences which reciprocate and affect one another, carrying on the outflow properties or qualities which are detected by sensitive receivers at considerable distances; but such exhalations, effluvial or magnetic, never come back to us bringing conditions they meet. The effects they produce, or impressions they make are often indicated by sensible *ex*pressions of delight or displeasure from the recipients who are affected by them.

The idea that any part of our system reaches out invisible tentacles to return with captured intelligence, is an error; although they cause responses in the object reached. These responses are expressions from animate objects. From inanimate objects they come as echoes.

All bodies exhale exfluences which become influences when other bodies absorb them; sometimes copiously enough to feel or sense the character of the sources from which they emanate, and sometimes to describe them with remarkable minuteness. Even disease is conveyed on the "magnetic" tide which is constantly a medium of ailment, thought and character transference.

In a higher life unencumbered by organs of sense (on which we here so much depend), and without physical

sight or speech, intercourse may be easier and more enjoyable.

The radiant energy of a human brain is enormous and is easily perceived by other brains which are in properly corresponding relations. This perception comes by impact of thought rays or waves from one brain beating against others. Perhaps the meeting of these mental forces very near the receiving brain, or within it, produces illuminations by resistance; just as light is produced near and on the earth by physical rays from the sun meeting kindred rays within our magnetosphere and atmosphere. Emanations from the earth are sometimes active enough to produce visible effects in aurora borealis when the sun's rays are not overpowering, or when they coincide as they come from the farther side of our globe. There is nothing more mysterious than this in the halo around a highly magnetic head. Thought rays or waves from a human brain are as real and effective as magnetic emanations from its mother earth; and emanations from the entire human body are felt by another in proximity, when relations between the two are favorable for such sensations; sometimes agreeable, at other times unpleasant.

Objects which do not radiate but reflect light are seen by means of the physical eye. Why may not they be recognized by the mental vision also, although they be inanimate and emit no radiations as do living organisms? They may reflect light for physical eyes and radiate magnetism for mental vision.

Until within a few hundred years, teachers and people alike, religious and scientific, supposed the earth flat,

and the man who discovered the error was persecuted for heresy. Those individuals have departed; but though the priesthood of that day persecuted Galileo and ridiculed Columbus, that of to-day is loud in the praises of these martyrs; especially the latter who pioneered a path to treasures of gold, and an outlet for passions, the indulgence of which languished for want of innocent victims at home.

Now the whole Christian world believes much that free thinkers a few years ago were persecuted for teaching; yet the spirit of denunciation, prejudice and oppression survives. Even when the sphere theory had been accepted, the idea long prevailed that our world was in the center and that all else moved around it; that there was only one sun and one moon, both of which moved westward continually; whereas it is now ascertained that the moon moves in the same direction as ourselves; but, having a vastly larger circuit requires more time in which to complete it and, although moving with greater speed, continually falls behind. Hence, we pass it every day and find ourselves in the same relative position but once a month. Still, some people find it easier to believe that the sun goes around the earth in twenty-four hours, than that the earth goes around the sun in eight or nine thousand hours; and this when the sun is a million times the largest body, and in either case the distance must be the same. Within the author's memory, school-books taught "the sun was made to give us light by day, and the moon to give us light by night;" but no explanation was given why the moon was absent leaving us in darkness a large portion of the time.

"Scientists" yet say that the moon was formerly inhabited, but is now dead and cold. They teach that this earth was once a sun or a blazing star, and has been cooled into an inhabited planet; running its race to the moon's condition. It is also an accepted theory among these teachers that the aggregation and condensation of molecules, or matter, eliminates energy; whereas energy accumulates and intensifies instead of being evolved or dissipated thereby. This has been proved by Mr. John W. Keely, whose researches into the remote energies and operations of nature surpassed all predecessors or contemporaries, notwithstanding the vilifications by unprincipled enemies during life and fraudulent so-called exposers after his death; a most corrupt and cowardly proceeding, easily explained by those who saw behind the curtains and had the moral courage to face blackmailing influences operating through a willing press.

The doctors, undoubtedly, will declare preposterous the idea that they are in error; that the reverse of their theory is true; that our moon is in a gestative stage and is to be born as a full-fledged world many ages hence when our planet, the earth, will confer seasons thereon, as our sun does now on the earth; and that then the moon will present all equatorial sides to the earth and rotate on its axis instead of having a tilting motion of about five degrees as it now has.

The theory that this earth's interior is a molten mass, and that the center is a focus of attraction, is another scientific absurdity which must give way to rational truth; as will be shown farther on. That a portion of the interior is molten cannot be doubted; but it is a

comparatively shallow sea instead of occupying all within the outer crust. An outer and an inner crust, with a molten lava sea between, is within the range of reason as we shall show. (Figs. C and D.)

How a belief ever became general, that the moon's attraction exercises a pulling force on the ocean, causing tides, is impossible to understand of reasoning men, and it is quite as difficult, in view of their sanity, to see how they can believe that the moon is held from flying off on a tangent by being drawn towards the earth, under the influence of mutual attraction. Such a force would be properly denominated negative; and a negative energy is not possible of comprehension. (P. 100.)

A vacuum in one end of a cylinder does not attract the piston. It simply weakens the pressure which at the same time is increased in the opposite end, and the piston moves in the direction of least resistance, as matter always moves; under positive action.

When we take lemonade through a straw it is erroneously called suction. Instead we simply produce a vacuous (or negative) condition in the mouth and positive atmospheric pressure on the lemonade forces it to the place of least resistance. The lemonade is not pulled in by the mouth, be it ever so palatable, or "attractive," albeit the sour and sweet are said to be in affinity because of opposite conditions. Sour lemons and sweet lips are less inclined than two pairs of lips when both are very sweet. This appears to be an exception to a general rule that likes repel. But, instead of being drawn together, they are driven, by the mutual thoughts back of them, when there is no repelling force between.

What shall we say of the long accepted and established theory of universal attraction referred for its discovery to Sir Isaac Newton? Simply that it is an error and that our schools are therein teaching untruth. Our explanations and illustrations will verify this to every unprejudiced mind. Such a well-settled scientific dogma is a fancied Gibraltar of science and, in the opinion of schools, impregnable to attack. He who has the temerity to make an assault on this phantom fortress must be prepared for a fantastic fusillade of gibes and ostracisms; for so-called science abounds in bigots and intolerant persecuting devotees. (Pp. 84, 85 and 94.)

If the popular theory of attraction were true, there would be no hydrostatic paradox to cause puzzling arguments; for weight would quickly destroy it. In differential columns of liquid they would not stand at a level. The height of each would quickly be differenced according to their weights respectively. The small column would rise and the large one fall until their weights would be equal; but, as will be shown farther on, cosmonics makes the solution easy and shows that it is not a paradox, even though the two communicating columns stand at a level. So, also, when cold water sinks, and colder water comes to the surface as ice, the paradox idea vanishes as knowledge of cause takes its place. Nature's fondness for a paradox is as chimerical as her abhorrence of a vacuum. (P. 95.)

The only way the great problem of the universe can ever be scientifically solved is by studying and arriving at just conclusions regarding the true nature and character of force. Truth must supplant error in our pro-

cesses of education and systems of learning, which now are largely false.

Truth is both an impregnable fortress of protection and an irresistible engine of attack. The author of this book has neither dread nor hesitation. He regards it better to be vanquished by truth than to be victorious in error. He who overcomes in a conflict where error is beaten, receives the gratitude even of the defeated who are honest.

Egotism should be abhorred. It is egotistical to believe or suppose that our age is at the apex of knowledge; or that anything must be untrue if it does not agree with our preconceived views or our text books. Other discoverers and authors have had to give way, and present systems must yield if they cannot withstand assault. Even the assailants who overcome in any present conflict may live to see their own fabrics fall, or leave a theory to be overthrown by later discoveries.

Every claim here laid is an appeal to the reason of each reader, with the request for some better solution of the great problems of existence; and for any improvement in the bases on which our so-called sciences are founded. An inclination to decry is easily indulged; but an ambition to destroy is not easily gratified. It is better to have an imperfect structure than to be without shelter; and it is not a mark of exalted manhood to destroy without making some effort at erecting a better building.

It is better to have some theory than to have none, for a belief, however erroneous, affords an incentive to action, which, even though inaccurate, is better than

indolence. It inspires to emulation and eventuates in improvement. Indifference is a worse evil than activity in error, for, by the latter, truth will ultimately be accepted.

From the darkness of ignorance into the light of intelligence must be either gradual or blinding. Like the physical, so the intellectual eye cannot endure a too sudden change. Away from despotic rule into a free form of government must needs be through grades of betterment; but always mixed with wrong until the absolutely right has won. Even in our boasted freedom the struggle is yet on. Progress in science is thus far only *towards* the light. Some day we may be *in it.*

"Truth comes to us with slow and doubtful step,
Carefully views the ground on which she treads;
Ever turns her eye to see that all is right behind,
While with a keen survey she marks her onward path."

As rich fruits and beautiful flowers grow from seemingly filthy soils, so truth often springs from foulest errors. When these are discovered they are discussed; and as friction of mind brings the fire of thought, so latent light is evolved into brilliant coruscations from obscure but active brains. Many of our teachers are obstructing rather than assisting the truth. Our age is less liberal than ages to come. Errors and their adherents will die together, while truth and its teachers are coming forth to occupy the vacated places. Corpses of the dead past enrich the soil of a fertile future, in which will be recognized the great law of energy, force,

power and motion. Energy is the origin and motion the manifestation of action.

Energy, force, power, motion are the concatenation and gradation of influence effecting results and working as a law, universal in mental as well as in material operations. Ability is mental energy; will is mental force; effort is mental power and accomplishment is mental effect or motion. This line of action expounds the unity of law in all the operations of existence. Like every other truth when once known, this will guide us in the solution of all problems not yet proved. (P. 42.)

Unity of law is evidenced in crystalline forms on geometric lines like the waxen cells of the honeycomb; also in winter frost on window panes in imitation of living forms as ferns of the forest.

Every law of nature is exceptionless, continuous and infallible. Every law is conformatory to every other law in its results, rewards and retributions. No one can be revoked; not one can be evaded. Every one is an exponent of some universal principle. Penalties for disobedience attach to moral as well as to physical laws. They cannot be evaded.

It is a law universal that *force becomes power and is manifested only when obstructed.* To obtain power from air we must impede it. The wind-engine is an obstruction to the breeze or the gale. Water-wheels turn, doing work, by resisting the current's flow. When water is expanded into vapor or steam it accomplishes nothing until its expanding force is resisted by the piston. An electric flow along the conducting wire displays no

power until interrupted. Light, heat and sound are produced under the law of resistance. Human character is not an exception but is developed by overcoming restraints. The theory that antagonism arouses resolution is thus expressed by the poet, Goethe: "The obstacles we meet are the stairs by which we climb to success." Many are the men who have become influential because of their struggles in overcoming obstacles. Opposition arouses energy into fervency and force into power, evolving manhood from elements which never would become factors in revolutions but for the friction which brings out the latent fires of life. Opposition in debate arouses efforts which result in brilliant argument. The antagonisms of atheists and infidels have provoked preachers to determined effort for more practical Christianity and rational doctrine, whereby religious truth is brought into the light of knowledge and prospects of Christian peace brightened beyond precedent. So the war of tyrants against liberators resulted in the abolition of slavery, as it had liberated America from its thralldom to Europe. The character of Jesus glows with an effulgence all the brighter because of the obstructions and persecutions which He outlives.

Restraint or obstruction is an essential, but not the principal, factor in action. It must be overcome. The principal factor is force, which must be superior to the resistance in order to manifest power and obtain effects. The active must preponderate over the obstructive. Force is positive; obstruction is intermediate; power is the proximate and motion is the negative quantity. Energy is independent and infinite. Motion is depend-

ent and finite. These are the extremes. Force and power are the means. Taken together they constitute the proximate quantity as between the other two, which are ultimates of action. Obstruction is a requisite condition, but when superior to force, prevents the latter from any manifestation in motion.

Energy being infinite and omnipresent is predominant. Force being energy in action is the rule, while rest, if there be such, is the exception so far as matter is involved. Absolute stillness is not probable anywhere. It is not found and cannot be produced. Every molecule of matter is in motion; every atom is constantly in agitation.

On the difference between force and resistance depends the degree of effects produced. Action is intense in proportion as force predominates. Their differentiation is the cause of constant and extensive change. The nearer they are equilibrated the more healthy and agreeable the condition. Extremes of either are inimical to life. Crystals could not be formed without action, and they could not exist with too much of it. The happy medium is forever sought, but perfect equilibrium is never maintained. This results in unceasing change—the ideal existence.

Ships move against resisting waters because the force of the wind is made greater by a larger area of resisting surface of sail. This is the superior facility of wind over water. Oars also overcome the ponderosity of the boat by greater facility of motion in the resisting water. Fish could not swim if the medium in which they move did not resist them, as the fins and tails could not per-

form their functions. They move, as do all other bodies, animate and inanimate, in the direction of least resistance. No sounds are produced except when sound-waves are obstructed, and sometimes, as in the echo, reflected.

Transmitted heat is mild or intense in proportion to the restraint overcome in its passage, or the obstruction at the end of its journey. If perpendicular it is greater than if oblique. Oblique rays, however, are more effective in their *vitalizing* results. Note the difference in their effects at the poles and at the equator, or at any of the intervening portions of the earth; how slight at the poles where they slant, and how great at the equator, where they are vertical. The principle involved applies in all operations everywhere. The midway angle—45° —is the happy medium and most favorable to high development.

Morning rays from the sun seem brighter than evening rays because the former are contacting and the latter are coincident. So astronomers, by more or less frequent vibrations of light from any star, determine its approach or departure. The sun's rays are obstructed by our atmosphere. A sloping transmission distributes the resistance over longer distances and causes a slanting impact on arrival at the earth; whereas more direct rays produce greater effects by more obstructive impacts within less distance, causing greater heat near the equator than towards the poles. Besides, the earth also gives off rays, as does the sun. Where these rays meet obliquely the effect is less than where they meet more directly. Near the poles they nearly coincide and move

in approximately the same direction. The impact there is too slight for much effect. Their light would be very dim but for the reflecting snow and ice. Farther from the poles these rays flank, and still farther they partially meet. Nearing the equator they meet more directly, and immediately under it they clash with correspondingly fervent and brilliant effect; varying with Earth's differing positions, which cause the changing seasons.

Radiations from both Sun and Earth are perpendicular to their surfaces at every point; but the directions of their arrival at other bodies are infinitely varied and constantly varying at any given point, with both rotations and revolutions (as of the earth both on its axis and in its orbit), although as a whole they may be considered always the same on any one planet.

Rays from the earth have to struggle through our atmosphere, developing warmth by restraint or resistance. The sun's rays also are struggling through our atmosphere. When, owing to position or some other cause, they do not meet with sufficient directness, the fervency and illumination are not sufficient for summer's heat and light.

The rays resisted by atmosphere develop heat, while those contacted by their kind, i. e., magnetic meeting magnetic, produce light.

The lens form of Earth's magnetic and atmospheric envelope, by refraction and focalization, has much to do in modifying both light and heat.

As downward rays reach our atmosphere, pass through it and meet its resistance, they are focalized; curving as

the atmosphere becomes denser, so that they are intensified as they approach the earth somewhat as they are affected in passing through a sun glass. This refraction enables us to see the sun both earlier and later than we otherwise would, and also to exist nearer to the poles. This problem, however, is not solved, and cannot now be intelligently discussed. Many of Nature's problems remain unsolved because the factors and interferences are not known.

Of course, the larger the sun or planet, the greater is its capacity as a reservoir of magnetism; and hence the greater the volume which it can supply. This is an important consideration; but still more important is the principle of its *areal* effects on radiation, and also of its distant influences; for the larger the sphere the more nearly does its form of surface approach a level plane or straight line, *consequently, the more nearly do its rays, departing at right angles, thereby pursue a parallel course to distances far away, and, because less divergent, continue nearer together; hence, a larger number of them reach a given space or area at a given distance* (Plate 7), *while the smaller the sphere and the shorter or more acute the curvature of surface, the more divergent or spreading are the rays, and the more limited their extent of reach with equal effect.* From the earth rays rapidly diverge, becoming sparse, widely separated within a short distance, hence very weak and ineffective before they reach another planet, except the moon, which is near, while rays proceeding from the sun are larger in volume, depart from a surface more extended, hence less abrupt in curvature, and so nearly

a level plane that (leaving at right angles thereto) they proceed in more approximately parallel directions and separate very slowly, reaching to a much greater distance before they are far apart. Hence many more impinge on a given area, with proportionately great effect.

The result is that the point where sun rays and earth rays are equally apart or separated, is very near the earth. This is the line of magnetic equilibrium, or bed of motion on which the child, the earth, revolves around its parent, the sun. The diameter of the sun being 180 times the diameter of our planet, the curvature of their surfaces is differenced by corresponding degrees, and the divergence of rays is varied accordingly.

This affords a means of determining the distance between Earth and Sun whenever we can ascertain their difference of mass and relative direction of rays proceeding from their two respective surfaces at such great variance of curvature. (Plate 7.)

In estimating the distances between bodies, by the parallelism or divergence of proceeding rays, another factor must be taken into account, and perhaps other factors as yet unthought of. Refraction of rays is perhaps the most important, and presents a possibly insuperable barrier to estimates of either distances or directions with any approximate accuracy. Such estimates, however, are of little consequence, in comparison with a knowledge of the great principle which underlies all action, and the true law recognized, replacing the erroneous theory of attraction. Estimates of distances, and also of directions, are formed by other methods

which, however, may be very inaccurate, owing to interferences above mentioned which render telescopes and spectroscopes alike unreliable in all past and present methods.

Volume of energy does not so much determine distance of reach as does parallelism of rays [see p. 61], whereby many impinge on a given area of surface, for instance, a square inch. A thousand instruments of music will not be heard much further than one, although the volume be a thousand times as great. As volume of a sphere and its convexity of surface are likely to correspond, they need not be separately considered in any calculations proposed. Mass measures capacity as a reservoir or storage battery, while curvature of surface indicates comparative reach of projected rays with effective impacts.

In all of this color plays a conspicuous part; and each color has its especial order of action under the one great vibratory law. Blue, red, yellow, etc., each comes of a specific range of pulsations in time, distance and form, differing from every other, while blending shades infinitely multiply and complicate the variations.

The differences in distance between the two bodies at perihelion and aphelion—about 3,000,000 miles—is due to the one grand annual oscillation of earth in its orbit; more easily observed than accounted for. On this great orbital variation are the daily oscillations forming its crooked path, as billows on tides, under the law of universal wave motions. Sidereal oscillations are to be inferred under the same universal rule. The moon performs a spiral in relation to the earth, and these

together move in a grander spiral around the sun; therefore, we may safely infer that all other satellites—moons and planets—behave in like manner towards our sun; and also that the same law is followed in all other systems of stars and that each one of these many systems obeys the same law in its movements around a great sidereal center.

Magnetic radiations from both Earth and Moon blend in one magnetic sphere and move together around the sun. Other planets and their moons do likewise. Therefore, our sun, with all the planets and moons of our solar system, so blend their magnetic spheres in one comprehensive sphere as to move in one magnetic mass, like a single orb around its great supersolar center, while a grand system of supersolar systems are in like manner moving around an extra supersolar center of a supersolar universe composed of many solar systems made up of suns and planets with attendant moons.

Pulsations or Vibrations Constitute the Basis of All Motion. They form a great law of action, determining results when energy, by restrained force, ultimates, through power, in motion. *Resistance, restraint or impediment, is a condition of all observed effects.*

All matter, in its constant agitation, differs in stages or in ranges of molecular, atomic and etheric motion; ether in atoms, atoms in molecules, molecules in mass.

The ocean oscillates in tides on which are billows bearing waves. On these are wavelets carrying ripples with ripplets, and these yet finer lines of surface motion. The earth's orbit is one grand radial variance per year, made up of 365 line-waves, while its axial rotation is

uneven, with its mass in constant agitation or tremor, and its atmosphere is burdened with pulsations causing sound, heat, light and other forms of continual disturbance.

Any tree bending under a gale, while its branches also sway to and fro and its leaves tremble, is a visible expression typical of universal energy and its ramifications through force, power and motion, in many branches from the great source which is too remote for physical sense to recognize, but which the higher faculties of soul consciously behold in the light of reason, impressed by analogy and proved by the results of experiment.

The ingenuity of man has devised means for counting pulsations of sound and vibrations of light, neither of which can be recognized by unaided physical sense. He ascertains the existence of molecules by their proportions in many chemical combinations. He recognizes the arrangement of atoms in these molecules, and measures the ranges of their motions by which he determines the tenacity and integrity of their mass. He essays to demonstrate the distances of planets from the sun, the rate of speed in their movements and the composition of their substances. He also, by photographic science through our most powerful telescopes, proves that suns exist beyond the human ken. Astronomers estimate that 100,000,000 suns—centers of systems—revolve within range of their largest instruments.

It is not conceivable that infinite space lacks ample room to accommodate any imaginable number of systems. Their distances apart are so vast, and they are

so far from us that, under the law of perspective, one entire system revolves within a range of what appears to us like a single point of light; and we call it a star.

In his beautiful inquiry concerning the souls of brutes, Martin F. Tupper says: "There lacks not room nor time nor care, where all is infinite," and "space is wide enough for every grain of the broad sands that curb our swelling seas, each separate in its sphere, to stand apart as far as sun from sun." A more sublime utterance of grandeur concerning immensity of the physical universe cannot easily be imagined.

Each orb is the center of its own magnetic sphere, immense beyond imagination's grasp; and extending through other magnetic spheres, which are embraced, the smaller within the larger, until there is formed a solar system composed of a sun, its planets and their moons, constituting a distinct group of stars apparently independent of other groups, while really they are members of a great family of such groups or systems held in order by interlacing magnetic rays with a binding force inconceivable to the human soul and incalculable by human intellect. A whole system, so held, revolves as a single sphere around its own solar center as an axis, while moving as a mass in a great solar orbit around a supersolar center along with other systems to which it is related by kindred family ties; and while they cannot clash, neither can they fly apart; nor can one system, solar, supersolar, or extra supersolar, act otherwise than as if it were a single star in its behavior towards its relatives in a group or a great group.

Every great group of extra supersolar systems per-

petually moves along with associate neighbors of like proportions in the direction of least resistance towards a starless realm of infinite space, a region which is not already occupied or is least occupied by matter.

These blending magnetic spheres have lines of magnetic equilibrium between each two orbs—as between earth and sun. This line of equation, where the rays from each are of equal intensity, is always nearer to the smaller body, or smaller family of spheres, as the case may be; and its distance from each is in proportion to their difference in size, by virtue of the difference in divergence of the magnetic radiations depending on their less or greater curvature of surface, which governs the variance from parallelism of the departing rays, while their corresponding masses govern the proportionate volume of radiation sent forth. (Fig. B.)

Evaporation from liquids is according to surface exposed rather than volume contained; so likewise is radiation according to surface or area instead of the volume or mass of matter from which rays proceed. Below the surface radiation is less in proportion to depth, because of restraint or obstruction by superincumbent mass, whereby force is transformed into fervency. While it is inevitable that area is increased as mass is augmented, it is not necessarily in the same ratio. Much depends on shape. A flat and thin body presents more surface than a cube or sphere of equal weight or mass. The surface of a sphere is less than that of any other form equal in quantity of matter; but the larger the sphere the greater must be its area, and of necessity the vaster its radiative energy and of ter-

minal influence, whether calculated by mass or surface. But curvature of surface is the true basis of estimates, and, as we are dealing chiefly with spheres, these are to be kept in mind as we proceed.

Rough and uneven surfaces give a greater area per volume of mass than perfectly smooth, polished and even surfaces; or, what is regarded as level, though of a sphere. Level here means a line or plane equally distant from a center. Rough or uneven surfaces of any area give off a larger number of rays than smooth, polished and even surfaces; but they are less potent and far-reaching, for this reason: In rough regions of the earth, where hills and mountains abound, rays from the surface may be perpendicular, horizontal or diagonal to the general exterior of the globe, and so cross one another as to interlace and, by dispersion or interference, be less effective, whereas in level regions rays are more nearly parallel, harmonious and effective on the air, and also on distant bodies of solid matter or spheres.

Rays are emitted at right angles to surfaces unless refracting influences affect their direction. Their departure is always in form for the greatest effect; i. e., in harmony with Nature's requirements, aiming at the highest results; but their arrival at points of destination is infinitely varied in effect, according to direction and impacts on objects reached. The angle of incidence is of great importance in determining effects. The diagonal of 45 degrees is most effective in reaching high results.

Our sun is more than 1,000,000 times larger than our planet, while they are less than 100,000,000 miles apart.

The difference in mass and surface curvature being proportionate, the line of magnetic equilibrium between them falls within 100 miles of the earth, which approximates the true distance. (Plate 7.)

Where 100 rays from the sun meet 100 rays of equal intensity, from the earth, is this line of magnetic equilibrium—the bed of motion on which the earth rolls around the sun. As this bed of motion is many miles from the earth, whereby the earth, being surrounded by a magnetic sheath somewhat like unto the tire of a carriage wheel, may have its axis of turning far outside the surface, at this line of equilibrium, as the wheel's axis of motion is on its periphery, where the tire touches the earth; and as the wheel's hub and axle travel in the same direction and at the same speed of the entire carriage, so may the earth's axial center move on a curve or a straight line (as the case may be) as the entire earth moves, its axis of motion (p. 40) being on the side farthest from the sun, as if it were rolling on the inside of a circle larger than the earth's orbit, by effect of sun-rays in contact with earth-rays between earth and sun, at this line of motion; as one cog wheel is turned by the cogs of another, or as a carriage wheel would move if turned by the rotation of the earth; in which case the top of the wheel would be the axis of motion and would move approximately in a straight line, while relatively to the bottom of the wheel it would not move at all.

Imagine a stationary level plane six feet above the earth at its equator. Then imagine a six-foot wheel between them touching both plane and earth. If now

the wheel be turned by the earth's rotation and rolled against the plane above, along on the plane's under side, the top of the wheel will be the axis of rotation, while the bottom of the wheel will move with the surface of the earth at the rate of 1,000 miles an hour and the hub at 500 miles an hour, the top of the wheel, relatively, not moving at all, but being the axis of the entire wheel's motion.

The line of magnetic equilibrium between the earth and its moon is comparatively near to the latter. The moon's distance and relative size may likewise determine its range of contacted rays, or the distance away at which its rays meet those from the earth.

Rays from the sun onto the moon are so reflected by the law of incidence on a spherical surface that they are thence thrown to the earth in like degree of parallelism to that of their process between sun and moon, so that rays from the sun to the moon and thence to the earth come to us with more directness, force and volume than if radiated from the moon.

The difference in condition between any two bodies or spheres, where one is the center of the other's orbit, is of great importance in determining the relative distance reached by lines of radiation, and thence of the corresponding distance from each body, of their common bed of motion. In the case of Sun and Earth both bodies are fervent; and the line is farther from the earth than it would be were the earth a dormant body, while also it is nearer to the sun than it would be if that were more fervent than it is, or if it were what it is supposed to be, a ball of fire or a molten mass—a fixed

fountain of heat warming the earth by calorific rays traversing etheric space a distance of more than 90,000,000 miles.

The moon is not so fervent as the earth—not so much alive; therefore, the earth's magnetic rays reach with dominating force nearly to the satellite, but not sufficiently near to develop light within its very scanty atmosphere, so that only when rays from sun and earth unite is there light enough on the moon to produce brightness visible on the earth. Hence the shadow of the earth on the moon alters its phases from new to full, and so on, according to their relative position. Yet, were we on the moon, in as complete an atmosphere as now envelops the earth, our planet, Earth, would appear to us as dazzling as does the sun.

Earth, seen from the planet Venus, appears as bright as Venus does to our eyes. Both Earth and Venus are as bright as the sun, in proportion to size; but their spheres being small, rays from them separate so rapidly that they disperse into space and soon lose their power of impression. The moon's radiations are still more quickly dispersed; her body being small and her surface curvature being short or acute, they never come to our atmosphere with sufficient force to produce any perceptible effect. Hence the moon does not seem to be self-luminant.

Quantity of magnetism is in proportion to the mass of matter which is its source of supply. Reach of effect by distance is according to extent of surface curvature, which determines divergence or degree of parallelism

and hence volume of impact on objects. This repetition is warranted by the importance of the law.

The sun's magnetic rays depart from so large a sphere that their divergence is very gradual as they proceed on their journey; and a sufficient number of them reach our atmosphere (pp. 69-71), meeting magnetic rays from the earth to produce heat and light ample for our life, growth and energy, together with all the grand beauty by which we are surrounded. So impressively sublime are these magnificent wonders that we have exalted ideas of our sun as a source of energy. (Plate 7.)

In the dim light of knowledge now possessed, or even in the twilight of its earlier dawn, is there any theory, or anything, more preposterous and absurd than the teachings of our most eminent preachers, professors and experts in physics: that rays of *heat* emitted from the sun traverse absolutely cold space over 90,000,000 miles without giving up their caloric until they reach objects on the earth?

Up to dates quite recent, even among so-called "scientists," the sun has been, and yet is, regarded as a ball of fire, while many foolish theories prevail as to what keeps up the caloric. If the sun were a fiery mass, emitting heat and light directly from its own body, the tops of our high mountains and the upper portions of our atmosphere would not be so cold, for they would be nearer the source of heat and light than the valleys and lower stratas of air.

In the elevated regions our atmosphere is too rare for serious obstruction to the sun's magnetic rays; hence heat is not there intensely developed, while in the denser

atmosphere and greater consistency of earth's magnetism in lower portions where the sun's rays are more impeded, yet can penetrate without the obstructions or interference of solid objects, are more favorable conditions of warmth. Light rays reach to a greater distance, and, being more diffusive, are but slightly differentiated between high and low portions. In high portions, where the air is thin and less laden with moisture, light reflections are less obstructed, and hence objects are clearly seen at greater distances.

As before stated, our limited space does not admit of anticipatory answers to all possible questions. The subject is vast and varied beyond estimate, and this treatise though very compendious, must serve our present purpose.

The object here is more to arouse inquiries than to answer them. Errors are often, yet honestly, promulgated by the schools. Teachers adhere with remarkable tenacity to text-books based on unfounded theories, which they can neither explain nor understand. Blind leaders of the blind. Theorists gain for themselves both notoriety and money by propagating irrational views revolting to every sense of right. It is amazing to see how large a number of persons, both men and women, subsist on the credulity and inertness of their fellows—on mental and moral prostitution. Their teachings are fathered by either ignorance or deceptive intent. The views entertained and advanced by instructors that God makes worlds at once (or in six days) complete, full size, and replete with life, occupying but a few hours in the operation, and projects them

into space instantly and with sufficient force to keep them whirling in great circles for thousands of years, is foolish enough to pass without comment or notice, were it not that this is in line with a train of hideous and repulsive errors which have caused suffering to millions of unthinking believers.

Less of theology and more of common sense would bring vastly more benefit to the race, and less danger of condemnation to the teachers who, by turning many from the error of their ways, would be more likely to please Him who said: "My people are destroyed for lack of knowledge."

It seems very strange that any intelligent creature can believe that God lived alone from no beginning up to six thousand years ago; then, in six days—144 hours of work—He made all the worlds and laws, and has been resting ever since. Where was the intellect with which His beneficence endowed the race, when it entertained this preposterous absurdity? How is it possible for even the plain people to be frightened by any hideous pictures presented for their torture, when coming from such trifling teachers? Would the prodigal son have been punished by his *father* had he not returned? No; he would only have suffered the penalty of his own unwise course. But the silly world is attracted more by trifles than by truths. Tobacco smoke and beer froth are more fascinating than bread and butter.

Some obscure astronomer springs into notoriety by expressing, through the press, an opinion that the planet Mars is inhabited; and straightway the world of readers is agog over the idea because newspapers herald a notice

of his declaration. Neither the papers nor the professor has an opinion worth any more than the conjectures of the merest novice. An abler thinker's view may have passed without notice, unless he has achieved notoriety in advance; which, however, would not enhance the value of his opinion.

Sir John Herschel gave out an estimate, and professors have often repeated it, that a cylinder of ice 46 miles thick, if darted into the sun with the velocity of light, or 190,000 miles per second, might be melted, as fast as moved, by heat radiated from the sun, without lowering the temperature of the sun itself; because of the great volume and high intensity of its heat extending far into space. This would be melting such an enormous bolt of ice at the rate of 11,000,000 miles per minute. It is not easy to imagine how any rational man can repeat or entertain such an absurdity. There is very good reason to believe that the great cylinder projected as described would reach the surface of the sun entire, unless thawed by friction produced in passing through the sun's atmosphere.

Friction is obstruction which, as already shown, develops heat. Two pieces of wood may be ignited by rubbing them together, and a rod of iron may be heated to redness by impacts from a hammer. Devoid of his title, John Herschel's opinion would not have been esteemed of much importance, nor given prominence in scientific books. Genius is worth infinitely more than title, as character is more than reputation; but the latter attracts more attention and secures more patronage than all the others combined.

Rays emitted from the moon do not reach our atmosphere in sufficient quantity to produce light, nor probably do many rays from the earth reach the sun's atmosphere. Rays between planets interblend; but no rays emitted from any planet or satellite ever penetrate the atmosphere of its parent with any considerable effect.

The star Sirius is many times larger than our sun; and, if it be our supersolar center, then our solar center never sheds its light thereon; and if Sirius be inhabited, our sun appears there as the earth appears to inhabitants on the sun, and as the moon appears to us—merely a light-reflecting luminary.

Earth is as really a ball of fire as is the sun. Their form and formation are similar, as there is a similarity among all the spheres. These are infinitely diversified, however, as trees in a forest are infinitely diversified, although bearing a strong resemblance in their general appearance. Unity in diversity is the rule of Nature. It is true of trees and of human beings; and it is true of worlds.

It is highly probable, and scarcely possible to doubt, that all the higher beings are of one general form without exact sameness. Especially should this view be accepted by those who believe that we are created in the image and likeness of God. If God be the pattern and parent, how can His copies or imitations widely differ one from another?

We sometimes desire to visit other stars. If we study our own star we shall have a general idea of all. Different countries on our planet, although not alike, have resemblances. Until we have seen the beauties of our

own, we should not long to visit other stars. It is quite possible that ours excels them all in attractions. Perhaps it has been selected by the Creator for His most wonderful manifestations—at least for a great period.

Space, the prime factor—the essential precedent in existence—is absolutely and unalterably one. (P. 29.) Matter, the cohered succeedent of space, its antithesis in all properties and characteristics—its absolute counterpart—is, in its primal condition, also an invariable unity. Its varyings afford infinite diversification, which increases with organization from simple to complex forms or shapes. The more highly organized, the more complex the formation; yet, throughout all changes, types remain while variety multiplies along the ascending scale.

Luminiferous ether is probably one and invariable. Diversification is manifest even in the gases. Air is more composite; and water is still more a subject of composition and variation, for it holds the various other substances in solution and in greater quantity than air does.

As we pass from liquids into solids the tendency to conglomeration increases. Crystallized forms are more the subjects of variegation than is water; and other forms of earthy matter are less pure or simple than crystals. This is due to the purifying process of crystalization, each form and quality of matter selecting its kind for association. The tendency increases as we pass into the vegetable and on to the animal; while the societary world is vastly more variegated and variable than the merely animal.

As worlds—the stars—are near the primary stage, being early in the scale of material existences, it conclusively follows that uniformity of type is more characteristic of them than of the later and higher developments. Evidently all of them are spheres, and probably each is a type of all. If each human being is (in general shape) a type of all human beings, and every tree is a type of all trees, it is rational to conclude that, in general form, our world is representative of all the worlds. As other moons in sight are similar in appearance to our moon, and other planets bear a resemblance to our planet, it is a reasonable inference that other suns are nearly like our sun in shape and composition.

Stars, being nearer the genesis of creation, are less differentiated than the more advanced orders of existence that inhabit them. Not one of them is or ever was a fire-ball or a blazing-star. They are hollow spheres, the great interior cavities of which, when in advanced stages of development, communicate with open space through polar vents. A description of the earth conveys a general idea of all as to shape and composition.

As the anatomy of one man affords a general idea of all human anatomy; and as North America gives a general idea of all continents, so the anatomy and physiology of our world furnishes a general idea of others. Seas and shores, mountains and plains, rocks and rivers, etc., etc., make up a continent. They all differ in details but have a general similarity. Oceans are similar, lakes are similar and rivers are similar; yet no two are alike. When we see one we see a type of its kind throughout the world. We can even sit in our own homes and

obtain an idea of scenery and its especial features throughout the world by means of maps, photographs and other pictures. We need not spend money or time to travel in order to appease our curiosity.

In other worlds mountains, rivers and oceans have a likeness to ours. Why have a desire to see them, when a complete variety is here? Our earth, as a type, affords us an approximate idea of the physical universe, and, so far as we know, affords all the essential elements of a heaven, although it may not be *the* Heaven, Yet we do not know but this may be the chosen world.

Universe means unity in diversity, or diversified unity. It is the university of Nature. One grain of sand gives an approximate idea of all sands. This world and its external relations are enough to study in order to have *a comprehensive idea of all other spheres* and their external relations—one to all the rest. They all float in the great *ocean of ether* somewhat as a toy-balloon or a soap-bubble floats in air.

Worlds cannot fall except when satellites collide against planets, for there is no up and down to space. Direction relates only to bodies in question when we use terms expressive of any course taken. Down is towards, and up is away from, any sun, planet, or satellite.

When the momentum of a meteor is greater than the repulsion of a planet the latter is overcome and the two bodies meet with a velocity which produces the effects we observe when such an event occurs at night. Our globe, moving at the rate of 1,000 miles per minute, overtaking or overtaken by a meteorite, or crossing its course, the meteorite meets with enough resistance in

our atmosphere to evolve heat sufficient for an explosion. They are driven together instead of being drawn, as our teachers tell us.

Countless millions of meteorites, formed in the same general way, although infinite in variety of particular shape and size, are constantly moving through space as bullets fly thickly through the air in time of a great battle. If between contending armies an immense boulder should swiftly pass it would quite likely be hit by a few bullets or cannon balls. So, as we swiftly move through space, we occasionally cross the path of one of these meteoric rocks; and less frequently, perhaps once a year, we pass through a stream of millions of meteors; and a few, under this high speed, come within Earth's aura and, yielding to the interference with its environing energy (momentum overcoming resistance), are precipitated or fall with great velocity and such effects as are often seen.

In a similar way, at widely distant periods of time, satellites may have collided with planets other than their own, but not within our telescopic times when observations are being taken. It is not supposable, however, that such collisions ever have occurred, or predictable that they ever will occur, for the distances between any of the larger bodies are so vast, and the repellant energy of each is so great, it is not likely that any one of them ever passes closely within the magnetic screen of another and larger sphere, whereby their precipitation is likely and their existence endangered.

The distance traveled in a given period by the periph-

ery of any spherical body in its rotation does not essentially determine or proportionally influence its centrifugal force. This is augmented or diminished according to the number of rotations on its own axis within a given time. Speed of motion is an important factor in centrifugal tendency, but the degree of surface curvature is equally so. Vastly greater momentum can be endured without corresponding tangential force on a long curve or extended circle than on a short curve or small circle under the same rate of peripheral speed. Tangential tendency is very great on a small sphere or circle under a high rate of peripheral speed; but very little on a large one at the same speed, because the larger the sphere or circle, the more nearly does its periphery approach a level plane or straight line.

Size of sphere or length of curve is one factor, speed of motion is another, while a third one consists in the application of revolving force at either the axis or at the periphery. If a body be turned by force applied on the periphery, there may be no centrifugal tendency, while this might be very great if the same force were applied at the center.

As the earth is turned by force acting on the surface (p. 82), any tendency of its particles or objects to fly off is thereby counteracted or overcome. The surface or circle being large, the turn is not short enough, under its rate of speed, for much tangential tendency; at most, not enough to equal the downward or inward influence, even were the turning force applied at the center instead of at the surface. This is not presuming

such an application to be possible with reference to the earth. It is only suppositious.

The turning force applied or exerted on the periphery of the earth, is inward or centripetal in its tendency, so that the greater the turning force, and consequently the greater the motion, the greater also is the gravital, and the less the tangential tendency or centrifugal force. In other words, the centrifugal is resisted and overcome by the action from all directions converging on the earth.

For a proper estimate it is important that we observe the difference of speed between points at or near the poles and those on the equatorial belt. The great circle at the equator travels a long distance in a single turn of the globe; and hence is under a high rate of speed as compared with smaller circles near the poles and along the entire polar axis. They revolve in the same time, but the difference in distance traveled is very great. At the equator the speed is greatest—about 1,000 miles an hour—while at the polar axis it is nil. Near the axis a circle of 25 miles requires as much time in turning as the great one of 25,000 miles. Because of the difference of surface motion at the equator and near the poles, and also the variation in curvature of the circles, it is impossible to calculate the variance, if there be any, of their tangential tendency, or centrifugal action. Were there sufficient centrifugal tendency to affect weight would not a man be vastly heavier at the poles where there is little or no motion than at the equator where there is the greatest?

"Let anyone enter a deep mine or go through a tun-

nel under a high mountain. He will find all objects, even his own body, weighing less on a delicate spring balance, than if weighed above ground;* and this decrease extends to the center of the earth."

—J. H. Kedzie, on Gravitation, p. 159.

The statement that "this decrease extends to the center of the earth" is mere guesswork and without any more authority than conjecture from anyone else, and with less of logical inference than counter theories given herein.

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* This is due to the intercepting of the downward force by the screen of earth above him; not to any diminishing of attraction by approach towards the center of the earth. Remove the screen and weight would increase towards the center because of greater convergence of inward rays—an intensifying action—and a greater divergence of outward rays—and extensifying or dispersive action. The former is an increasing or strengthening potency; the latter a lessening or a weakening process, i. e., a diminishing potency. The nearer a center or focus, without an intercepting screen above, the greater the weight; but the greater or thicker the intercepting screen the less the weight. Because of a closer parallelism of rays giving stronger outward and weaker inward action on the surface of the sun, weight of bodies is there less than on the surface of the earth (contrary to the teachings under "scientific" auspices in our schools of learning), if we end the solution here; but the sun's diameter is great and is proportionately an obstructive screen to force-rays transmitted from the opposite side. This offsets in some degree the greater outward effect of parallel rays from the surface. There is no pretense here that all the factors are taken into account. The discussion would be too lengthy and elaborate.

Again, Mr. Kedzie says, on p. 160: "A given amount of motion has been injected into Nature, which may change in form, or change its subject, but remains forever in action without increase or diminution." This assertion is uncontradictable as it is unprovable. If a given amount of motion has been "injected into Nature," there must have been an injector and a period of existence or time when the injection was effected, unless the injecting process is continually and forever going on. From this it is to be inferred also that prior to such injection matter must have been in a state of rest. This inference is naturally followed by a query concerning the general condition of affairs before matter was made a subject of motion. Had it always been at rest? or was there, away back in the infinite ages, a period, without beginning, when there was no matter —no visible forms—only space and spirit—only space and incomprehensible intelligence—God? How far back was matter created and of what substance was it made? Spirit? Then whence came spirit? If there was no beginning to space or spirit, then why to matter?

He who does not believe in God, whom he cannot comprehend, is inconsistent if he believes in himself, whom he cannot comprehend. Any man cannot comprehend his own existence nor the existence of another man. He cannot comprehend his own beginning or his ending. Then how can he comprehend God?

Without asserting, is it not more rational to BELIEVE that motion is inherent in the constitution of matter, and that matter is the cohered succeedent of space—that as motion is positive and rest is negative,

and as the positive theory of existence is preferable to the negative theory, so motion is without any injecting operation or process? It is normal to matter.

Gravitation is to us an unsolved problem, unless we change from the NEGATIVE to the POSITIVE theory, which, from every point of our present view, appears to be the rational one. "ATTRACTION OF GRAVITATION" is a name given to supposed negative action, and is untenable on any basis of argument, although long taught in our schools as the true theory, authenticated by Sir Isaac Newton.

The observed effects which gave rise to this theory and its name, are a result of energy inherent in matter; not injected into it—and emanating therefrom as force, with positive effect in every direction on all environing bodies or substances.

Luminiferous ether, when regarded as matter, may perhaps be considered an exception to the rule here stated. It is probably the medium of action, through which force is propagated or transmitted. It may also be a source; perhaps the real source of energy; but more likely the great middle agent between the finer substance called spirit and the coarser substance known as matter. Its nature and the nature of all above it are unknown and uncomprehended by man except by analogy and inference. If any knowledge comes by inspiration higher than these it must accord with true reason. From so much of all these, as we may, let us express the following conclusions, using the term magnetism as a synonym for energy radiated as force.

MAGNETISM IS RADIATED FROM ALL MATTER AT RIGHT ANGLES TO SURFACES WHENCE IT DEPARTS; IS PROPAGATED IN STRAIGHT LINES BY UNDULATORY INSTEAD OF TRANSLATORY MOTION, AND IS PARTIALLY INTERCEPTED, RETARDED OR IMPEDED IN ITS PROGRESS BY ALL BODIES, WHILE IT PASSES THROUGH THEM AS READILY AS AIR PASSES THROUGH A SIEVE OR A FOREST.

IN SUCH PASSAGE THE MOLECULAR IMPACT PUSHES THE IMPEDING SUN, PLANET, SATELLITE OR OTHER BODY IN THE DIRECTION OF THE MAGNETIC RAY'S COURSE. THEREBY ANY TWO BODIES OBSTRUCTING SUCH FORCE ARE IMPELLED IN THE DIRECTION OF EACH OTHER WITH A POWER PROPORTIONED TO THE PRODUCT OF THEIR MASSES DIVIDED BY THE SQUARE OF THEIR DISTANCE APART.

They would quickly meet but for the counteracting repellant force emanating from them, which tends to drive them apart. All action of bodies is from themselves outward, whether it be of suns, planets or satellites; and when bodies fall onto any one of them it is because of intercepted rays, coming through the planet or other celestial body, being so weakened thereby as not sufficiently to counteract momentum and repel the falling body, which moves in the direction of least resistance. The unimpeded force above it is greater than the intercepted force below. This is advanced as a primal and conclusive truth concerning that force which we denominate gravity, whether it be of planets towards their suns, or of bodies falling to the earth.

Floating in highly attenuated ether, our planet, like every other star, is held intact and moved in its orbit

while being turned on its axis by external force, acting together with what proceeds from within. It is constantly "in the push." It is held and moved by repulsion instead of by attraction.

Coherence is not explained as a property of matter. Tenacity cannot be understood on any theory of attraction as now taught. It is yet a mystery. When a stone or any form of mineral or other matter is broken the pieces may be pressed together as closely as before; yet there will not be any sign of cohesion. The strength of linen thread or the elasticity of india rubber is not explained on the hypothesis of attraction. Inability to explain everything does not invalidate a hypothesis nor belittle either an old or a new theory concerning Nature's existence and operations.

POSITIVE energy—*push,* not pull—holds planets apart from their suns and one from another, and keeps them from flying off on tangents beyond orbits prescribed by the great law of magnetic equilibrium. The pressure on all sides of each body is nearly the same, but is constantly varying. The excess of pressure on any body causes its change of position, and excess of pressure on any of its parts causes its change of presentation, or of its attitude respecting its governing center, as of Moon respecting Earth, Earth respecting Sun, and Sun respecting the super-solar center, and so on.

Earth and Sun are pushed apart until the repelling force between them is less (because of their distance apart) than that which, on opposite sides, is pushing them towards each other. It is not possible for them to approach or depart beyond their mutual safety, and

under the same form of influences two planets cannot collide. When too near their magnetic spheres keep them apart. They are easily swerved, for in the ocean of ether they float so freely that an ounce of excess on one side will move a planet. In this constant and perpetual happy medium of ether equated energy is ever sought, but never found, by either planets or atoms. Hence both and all are constantly in motion.

Energy is everywhere and abundant. The secret of directing it will solve the great problem of expenseless force in mechanical power. Instead of working to overcome Nature it needs only that we place ourselves in harmony with it. Give her a chance and she will do our work for us, obviating all semblance of drudgery. When invention shall have been completed we shall have to only "*push the button.*" Men are mentally in error on this matter, and must reverse their mechanical, as well as their natural, philosophy to find what they want. That we now *push* a button instead of pull a knob at the door is an indication of the reversed processes into which we are passing.

Sun and Earth depart and approach, oscillating within a range of distance determined by opposing impulsions. So it is with Earth and Moon, and with other spheres. Each body revolves in the direction determined by the motion of its chief, as any cog-wheel is turned by the motion of another which governs it. The magnetic rays from both Sun and Earth blend and interlace, causing the latter to be turned by the former, which exerts a dominant force, determining the direction of earth's rotation. The earth's orbital movement

is really with the sun's axial motion, although *relatively* in the opposite direction, as the moon moves with Earth's rotation but falls behind, and thus has an apparently opposite motion—that is, while the earth moves as a mass along with the sun's rotation, its more distant or outer portion is turning (if it be turning at all) in the opposite course, and all the while the entire planet is falling behind, so that the sun turns many times on its axis, while the earth completes one orbital circuit.* Relatively, therefore, the earth goes around the sun many times in one year, because it is many times opposite every point on the sun's equator.

Every point in space is a focus of energy, and every body or object in space occupies a center of energy. So all force, the emanation of energy, is everywhere opposed; and all motion is the result of dominance; as a piston moves in a cylinder of steam because the pressure on one side is greater than on the other. All force is relative, proportionate and comparative, as well as positive. It is never absolute, as a vacuum is never perfect, only partial.

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* The earth turns and, while turning, is carried along with the sun somewhat as an antifriction roller is revolved by a turning axle. It moves around the axle and along with it, but not so fast. It rolls on the inner side of the surrounding encasement so that its axis of motion is on its outer side in contact with the said encasement as the axis of a wagon wheel's motion is on the ground at the point of contact. The earth's axis of motion may be several miles beyond the earth, out in the environing ether opposite from the side shone on by the sun; so that the earth's axis of motion is always on the dark side. (See page 69.)

A well regulated engine in the care of a competent engineer is easily controlled. The piston disc is easily held at any point in the cylinder by one who knows how to equalize the pressure. Steam acts under the same law that governs all forms of matter in its motions. Heat agitates water, giving its molecules greater motion and so requiring more space for their increased range, in proportion to the intensity of heat and consequent extent or degree of rarefaction. When the heat is intense, water is highly rarefied into very light steam requiring more extended room for its range of molecular motion and hence exerting greater power than heavier or denser steam. When in open space, it floats as thin clouds high in air until dispersed as invisible vapor or condensed into falling drops. When less heated and consequently less rarefied, those clouds occupy less of space and, being heavier, they require denser air to support them and they come nearer to the earth. When thin and light, force rays easily pass through them and the air in which they float. When heavy, these rays are more obstructed and so push them downward. When condensed into drops the force rays push them quickly to earth in the form of rain.

Under the same law sap circulates in trees. As vapor it rises through the delicate pores of the sap-wood and, when carbonized in the leaves, falls in a circular sheet of liquid around the tree within the bark, where its watery portion evaporates, leaving a thickened layer which hardens into fiber; and another grain of wood indicates another year of tree growth. The fiber is lengthwise in the direction of the sap's flow.

Action upward from the roots is through the porous wood in direct contact with the fluid, more direct and less obstructed, therefore more effective, because the *form* of the tree permits it; while the *shape* of the tree with its boughs and leaves, acts as a shield or screen against the downward force until the liquid is on the outside of the wood where downward vibrations reach it through the more porous bark and attack it in condensed form, pushing it earthward. This process is varied in the palms and some tropical hard woods.

The problem of polarity in plant ascension, descension and expansion may not be satisfactorily solved on the plan here elucidated; but it is as easily explained on the positive as on the negative theory. It is easy to see why plants ascend against a push downward as against attraction. If roots descend by the earth's attraction, why does the uppergrowth ascend against it? Plant growth may always remain among the inexplicable phenomena of Nature without interfering with any theory here advanced. What is here said concerning it, is open to criticism and calls for correction if in anywise wrong.

As stated elsewhere herein, and against accepted scientific belief, energy augments with aggregations or condensation of matter and lessens with matter's expansion or dispersion. Expansion liberates force and condensation accumulates it. Diminution in bulk, mass, or space, is a positive potency; and expansion or dispersion may be called a negative potency, considered intrinsically; although extrinsically the opposite is true; i. e., positive causes produce negative conditions and negative conditions are followed by positive results.

Convergence as a process indicates cogency or strength. Divergence or dispersion as a process indicates weakness. So, also, but variantly, as before mentioned, approach represents augmentation and strength while departure indicates diminution or weakness. For example, note that any object in sight at a distance can be discerned as receding or approaching by the diminishing or increasing effects on our visual organs; and an unseen train of cars or a band of musicians proclaims to our ears its approach or departure in the waxing or waning of sound waves indicated by louder or fainter noise, detected at any moment as the quickened or slackened sound vibrations impinge with intensifying or lessening effect on the listener. These vibrations on organs of sight or sound at any instant of time are greater or less as they approach or depart, although our physical senses are often so obtuse that some seconds are necessary to detect the action when distances are great, because the greater the distance the weaker the vibratory impact. According as they are increasing or diminishing they are positive or negative *relative* potencies although in *reality* they all are positive. That is: Their effects are produced by the same kind of motions but *relatively* they differ; as a stream of water is positive or negative in its relation to any person or object on its bank. All the water up-stream is approaching the object while all the water down-stream is departing—flowing away from—the person or object. The water above is positive while the water below is negative in relation to any object on the bank; although, as a whole, it is alike—flowing in the same direction—and therefore

positive. All the water below a dam is flowing away from it and is negative to the dam and all above it, but it has no pull on the dam. If the dam gives way it is under the action of water above it—*a positive action.*

As every body in space is or occupies a center of energy, all inward or downward action is focalizing, concentrative and intense; while the emanating—the outward or upward—rays, as from the earth, are diffusing, dispersive and weak in their tendency, as compared with counteracting or inward rays. Hence if all else were equal, the downward or inward action would be the dominant one, and weight would result to even a greater extent than it now does, were it not for the influence of other factors which must be taken into account. The centripetal action or vibration downward, is partially counteracted by vibratory action directly upward from the earth; and this action is augmented by centripetal rays from the opposite side, which have been retarded and weakened in their passage through the earth, as air is retarded by passing through a sieve or a veil. This action, centripetal on entering the earth, becomes centrifugal on its passage to the opposite side.

The importance of this truth warrants a repetition. Were this passage through the earth free and unrestrained, the action, both outward and inward, at every point on the surface of the earth would be equal, but for the difference in dispersive and concentrative action alluded to and from other causes given above; unless other factors not mentioned, influence results (which is quite possible and may hereafter be noticed). Were this force,

in passing through the earth, not retarded nor changed from concentrative into dispersive action, the downward or inward force would be so extensively overcome that no sun, planet or satellite could exist and no force could be generated from any body of matter, nor would there be any such body. Now, the downward force overcomes all others by just the excess indicated by weight, holding bodies against or on the earth.

Bodies on the earth are heavy or light according as they are permeated hardly or easily by the magnetic rays, which pass easily through porous matter but with difficulty through that which is dense, such as lead, gold or quicksilver. The more obstruction the greater weight.

When an apple fell from a tree, striking Newton on the head and starting a system of thought vibrations, it was in keeping with his age of civilization to think astray from truth. His environment was a cloud of error too dense for the permeation of undistorted rays. Their obstruction developed fervency of thought which but partially dispelled the darkness of his time and made things appear the opposite of what they really were. His mathematics was accurate but his philosophy was erroneous; following the lines of religious teachings full of superstitions and imaginations. When wrongly schooled on any subject people become delusionary and unfit for impartial judgment. The general effect of error is to bias intellect, preventing intelligent action and rendering it unreceptive of clear light from any true direction. Medical practitioners, losing their patients by thousands, hold silence as to the cause and even the fact; while they are quick to herald a single

failure in any reform system of treatment; and many professional scientists appear to rejoice at any failure or discouragement met by an inventor or a student who promises to evolve some new theory or make an improvement which contradicts what is now in their text-books. *Professed* lovers of truth are among the first persecutors of those who teach RATIONAL TRUTH.

The following questions are likely to be asked: If spacial force downward causes weight, why is not an object heavier when its broad surface is presented for attack than when it receives the force on an edge or narrow surface? The answer is: Force, producing weight, acts according to mass of matter instead of according to surface presented. It passes through the mass attacking the molecules and atoms just as it passes through the earth; being impeded in both cases. It is this impediment which causes weight according to the character of the substance. The more compact it is, i. e., the more numerous the molecules and atoms in a given bulk, the greater the number of vibro-atomic impacts; and hence the more of resistance and weight. It is the same whether the transmission be flatwise, edgewise, endwise or cornerwise; the mass impacted is the same.

So in the case of differential columns of liquid. The whole mass is attacked in both columns which rise equally to the same line, grade or degree of downward pressure and, under the cosmonic law of Nature's tendency and effort for an equilibrium, they come to and stop at the same level.

A body falling, under vibro-atomic resistance, is

impeded by atmosphero-surface resistance in degree according to speed of movement. Under a given velocity if it falls flatwise, the resistance is greater than if it fall edgewise, although static weight is the same. Liquids also resist by surface action.

Cynics may ask: How do you get over the difficulty of accounting for centrifugal force failing to throw off objects from the earth, or of the earth being thrown into fragments by high rotation of 1,000 miles an hour? We do not try to get over a difficulty which does not exist. Although fully answered on page 82, it is of so much importance that we give the answer again here.

The same impact inward or downward producing weight, constitutes pressure and holds the earth with its occupants together. This enormous pressure from without would be ample even if the tendency to fly off on a tangent were very great, which it is not. A thousand miles an hour of surface rotation on a small sphere 30 or 300 miles in diameter would be terrific; but, as already shown, the larger a sphere, the more does its surface approach a level plane; and as the earth is large enough to have an approximately level surface, as compared with a small sphere, the tendency to fly off is very slight.

A sphere 300 miles in diameter is nearly 1,000 miles in circumference. On a sphere or circle of this size a movement of 1,000 miles in 24 hours would not be subjected to very much tangential tendency or centrifugal force. The turn is not short enough. If a railway from Chicago to New York were bent into a circle, a train of cars could move around on it in 24 hours without any

perceptible tendency to leave so large a curve, or "jump the track." Now, the curve of our planet is larger by 25 times that length; and our movement along with it so nearly that of moving with a level plane, that even 1,000 miles an hour does not subject us to great centrifugal tendency. It is well nigh at a minimum; and is nil at the poles where the circle contracts to a point, yet occupies the entire time of 24 hours to complete one rotation. There the movement is not so rapid as the hour hand on a clock. Both circles and speeds increase as they are farther from the poles; rapidly at first but more slowly as the equator is approached, on account of longitudinal curvature which diminishes the increase of circle-size until at the equator where this increase ends.

On the equatorial belt is the greatest speed but least curvature; and as the latter counteracts the effect of the former it must be seen that the increase of tangency is not in proportion to speed motion—perhaps not at all. Centrifugal force is not indicated by distance traveled on the periphery of a circle, but by the number of revolutions of the mass within a given time. Besides, as before shown, our planet is rotated by action on the surface, and not by projectile energy at the center. The turning force is contractile and therefore centripetal in its tendency, instead of centrifugal; and on the equator where there is the greatest motion, we have, not only the most extended curve, affording the least tangency, but also the largest area of attack and longest leverage combined with greatest positive downward action or push from the sun which exerts the turning

force. Here, it is direct; and, although enough to keep the globe whirling, it is only a small portion of the all-force acting on the entire surface of our planet, the motion of which is greatest on the surface towards the sun where the most action takes place in just the proportion required; and with diminishing tendency towards the poles, at which both turning force and inward action, from the sun, almost cease.

Spacial force, aside from the sun's action, may be the same on the frigid zones as within the equatorial belt; but the sun faces the latter while it only flanks the former, except as its rays are deflected by the lens of earth's envelope. Hence where there is the greatest peripheral motion there is also the strongest inward or downward action. The importance of this "gravity" subject warrants the above elaboration, and admits of even more than can be afforded at this time, as that would be a departure from our aim at simplicity and brevity.

In view of this COSMONIC theory of energy, it is easy to show how the earth remains in its orbit instead of either being thrown off on a tangent or falling into the sun. In a circle 185,000,000 miles in diameter, we may travel 1,500,000 miles in a day without being projected into space beyond our orbit; for, occupying a whole year in completing so large a circle, accomplishes it without any more tendency to leave the orbit than moving one mile a day within 50 miles of the center of the sun, or around a circle 100 miles in diameter.

But this fact is of small importance, as is a similar one in reference to the earth's axial motion; for, as we

are held on the earth by a downward, inward or centripetal force acting from above, so is the earth held from leaving the sun by the same force acting through infinite space, dominating towards the sun, in excess of what proceeds from the sun and all beyond; for that which comes from beyond the sun is obstructed by the sun which acts as a screen to the earth which would be quickly driven to the sun, but for the sun's repellant rays which hold all planets off at proper distances; the planets themselves furnishing also a share of the repelling rays, as already shown. These radiations from Sun and Earth, acting against each other, hold the two orbs apart at a proper distance and, at their line of equilibrium, furnish a bed of motion on which the smaller star moves, rolling around the larger one. As they approach, the resistance becomes greater and as they depart it becomes less, and the opposing force drives it back to its normal position, or distance, in the orbit.

Thus we see that it is impossible for the earth to fall into the sun, or ever come so near as to be "scorched;" and also impossible to be driven off into space to a freezing distance. It is all right in this regard, and will so remain for many millions of years. Eventually, however, an important change will have taken place. But of this further on. (P. 106.)

The same force under the same law which holds the earth in its orbit, keeps the moon within proper distance while preventing her from coming near enough to "kiss us for our mother" Earth. Our love-making moon continually flirts with us because of the interferences always at work. (Fig. A.)

L. of C.

The magnetic radiations from both Earth and Moon meet, and so repel the two planets. This alone, would not perceptibly withstand the infinitely greater push driving them towards each other. The latter force acts also between the two after passing through them and being impeded and weakened thereby; and this diminution is fully made up and supplemented by their mutual repellency while they remain 240,000 miles apart. At any greater distance these repellant radiations would be too slight, and the two spheres would be driven towards each other. In other words—words of romance—at greater distance they do not observe each other's defects, and they try to meet; but only *distance* lends enchantment. Even swains and maidens would not be so enamored of the moon if privileged with a closer inspection. The moon is credited with great attractions when, like many other objects, she possesses few, if any. The force which brings her near, and also that which keeps her away, is positive and repellant.

To the moon's attraction is attributed Earth's heaving bosom—her "tide-y" action. Like other dogmas this one is easier to accept than to dispute; and so long as people are willing to pay for learning errors, they will find plenty of erroneous teaching. Yet errors are often of some use. Frequently they are thresholds to the temple of truth. We have to tread them under foot, however, if we would enter at the true door and within the veil.

The absurd idea, so long taught, that the moon, 240,000 miles away, pulls the water up into a tide against the stronger "attraction" of the much larger earth which

is in direct and complete contact with the same water and "pulling" in the opposite direction is not worthy of argument; but, for the injury always done by erroneous belief, we pay some attention to it here. This "pull" or attraction by the moon, Sir Isaac Newton is represented as having ascertained (or estimated) to be somewhat less than one twelve-millionth (1-12,000,000) part of the Earth's own attraction; yet the present popular theory of gravitation requires us to believe that one unit of attraction, pulling the waters of Earth towards the moon, actually lifts these waters in direct opposition to twelve million equal units pulling them downwards—towards Earth's center! It must be admitted that the two actions are in direct opposition; for the moon, and the earth's center, are always in direct line with some point on the earth's surface.

The moon-tide theory, therefore, as taught in schools and accepted by sailors and others, leaves us no alternative but the belief that in this tidal tug of war, one force-unit really overcomes to that extent, twelve millions of equal units acting in the opposite direction! What a comment on our boasted educational systems, and on our astronomical calculations founded in such mathematical absurdities as if they were facts!

If, as is also taught, the Earth's interior be a molten mass, tides must also therein be produced under the same influence; with results which we leave to conjecture.

It is easier to overthrow than to build up—easier to disprove a false theory than establish a true one; and, since the tides have been so extravagantly and so gen-

erally accounted for, it may not be entirely safe, in our present stage of knowledge, to lay down a theory on any line and call it established. If, however, what we have said about THE GREAT LAW of energy, force, power and motion, be rational and logical, it may be in place here to apply, even if crudely, the same principles to so important a phenomenon as the tides.

Every honest man, if not a dogmatic slave, seeks for truth, instead of arguments by which to bolster up a creed. The author of this book believes in what he writes; but is at all times anxious to abandon his belief in favor of a better one; and he will feel well paid for his efforts if they stimulate inquiry and investigation which will or may, eventuate in the absolute—the truth.

Our planet being a focus of infinite energy acting in force from all directions, and in turn being a source of energy sending out its forces every way—the former tending inward or downward producing weight called gravitation, and the latter acting outward as buoyancy or levitation, which also is aided by the former transmitted from the opposite side through the earth—it follows that all objects move to and from the earth according as the inward or outward force dominates one over the other.

Force from all surrounding space acting on the small surface of our globe is highly concentrative and intense; while that acting outwardly from the same small sphere is in a similar degree radiative or dispersive and therefore comparatively weak. If they were equal in all mathematical estimates as to number of rays, rapidity of movement and all respects that imply force quantity,

the difference between a concentrative and a dispersive action might account for all that we include under the term weight. Now, it should be borne in mind that the application of this great law of energy and its action, to account for tides, calls for arguments which are suggestive rather than assertive; and that the way is open for hints which are not here mentioned.

The moon acting as a screen, obstructs the passage of the downward or incoming force, restraining it sufficiently to effect some difference on that side of the earth; giving to the force radiating from the earth a possible advantage which might elevate the ocean several feet in that direction. Under the law of polarity the antipodal tide may be accounted for on this as easily as on the attraction theory.

Another possible factor already alluded to but which cannot be positively declared, may influence tidal action. By refraction a sphere may so change the intensity of the passing force as to alter the effect; as a globule of water so alters the direction of light rays that objects seen through it appear magnified. The earth and moon by their spherical form, therefore, may so alter transmitted force-rays that the resultant effect is very different from what it would be in passing through objects having plane or flat surfaces.*

* There is no reasonable doubt that beyond all measure of comprehension or estimate, the entire universe at every point abounds with energy either active or latent, and always ready to supply suns and satellites in whatever form is needed. So facile, so forcible, transmutive and effective is this energy that any description or even conception of its wonderful potency is impossible.

A pane of glass will so refract sun-rays as to intensify heat on the inside of a window. When diverging rays hit the outer surface they are bent inward so as to pass directly through. On the inside they concentrate, producing greater heat than if the glass were not there. Even a flat glass, therefore, is partially a sun-glass. If it were convex outward its concentrating properties would be stronger. We may infer therefore that the lens of air around the earth has concentrating qualities.

The theory that concentrative action is more cogent than dispersive action at the same degree of deviation or angle, inevitably leads to the conclusion that, on small or abruptly curved peripheries, where dispersion is greatest, concentration or focalization is also greatest. Therefore where outward or upward action is weaker, inward or downward action is stronger, and vice versa. So, the larger the sphere the less the weight on its surface and *vice versa.* Objects are heavier on the moon therefore, than they would be on the earth, and heavier on the earth than they would be on the sun. This is the reverse of received theories based on attraction according to mass of matter in the orb.

Again, the earth is known to oscillate in its orbit, moving in a spiral path around the sun. This is presumedly under the influence (not attractive on this theory) of the moon which, because of its lesser mass, and under the influence of the earth, moves in a relatively greater spiral than the earth's path, while the earth's motion is in a still greater spiral, relatively, than that of the sun around the super-solar center.

If the motions occur and relations exist, they must be

under the law here set forth; and momentum given to the earth under such oscillations may cause the tidal swayings or sloppings which are observed upon the shores of the oceans, seas and lakes. As wave motion appears to be a law of universal action, so the ocean may surge under the constant oscillation of the earth.

The tilting or swinging motion of Earth around its north polar axis giving the south pole a greater range, swings or sends its fluid portion towards the south pole under the law of momentum or tangential tendency, which also affects and perhaps effects our tides. This peripheral tendency is aided by the dominating force rays from the direction of Polaris. So the ocean is thrown and also pushed southward exposing more land in the northern hemisphere.

That the moon instead of rotating like the earth on its axis, always presents the same side for our view, is a subject of much comment. The side (or end) so presented is a pole. It is the axis on which the planet performs a tilting motion of about five degrees.

According to genetic law this is accounted for as follows: Like all other planets and their satellites, the moon is hollow; and as from its outer surface, so also from its inner surface, magnetism is radiated; and from the great central cavity it finds an outlet through the polar vent which is held opposite from our view, just as the feather end of the arrow or weather vane, denoting the wind's course, is turned and held in the direction in which it is blown. This keeps the opposite — the closed — polar end in the direction of the earth. Magnetic radiations or emanations from the earth, acting

in the same direction as the moon's magnetic polar outflow, causes this position. (Fig. A.)

The moon is an unborn planet in its gestative stage of development, with only one polar vent. When gestation shall have been completed, birth will follow. A new polar vent will then be accomplished on the side now towards the earth; and exactly opposite the one which is now in operation and established. The moon will then turn its equatorial belt towards the earth and rotate on its axis, behaving towards the earth as the earth now behaves towards the sun. It then, as now, will be a hollow globe with inner and outer crusts and intervening lava bed with external volcanic vents; but it will then have two polar openings as is now the condition of our planet. (Fig. D.)

The north pole (or end) of the moon appears as the axial pivot on which the moon performs its waving or tilting motion. As both Moon and Earth grow in size, and the distance between them increases they will both depart farther from the sun until, by the vastness of intervening space, the sun will become the pole star of the moon as Polaris now is of Earth—the pivotal center of its tilting motion. (P. 99.)

As the north pole of Earth is constantly towards the north star, so the moon's earthward pole will become the sunward pole when its equatorial presentation becomes earthward. The moon will then behave towards the sun as the earth now behaves towards Polaris; for, as the earth in its orbit around the sun is attended by the moon; so the sun in its orbit around Polaris is attended by the earth and its companion satellite.

Polaris is the super-solar center of many solar systems, not exactly like ours but similar to it.

The earth is the moon's polaris as the sun has been the earth's polaris, and will be the moon's polaris when development gives her (the moon) two polar vents and an equatorial belt, with tropical, sub-tropical and polar zones; with life and seasons conferred thereon by Earth as a solar center.

The earth and its moon both will be larger than they now are; the curvature of the surfaces will be extended and magnetic rays proceeding from them will be less divergent—more nearly parallel—extending their force to greater distances, driving these two spheres farther apart, and at the same time increasing life-giving energies of the earth on the smaller body—the moon—just as the sun now confers these conditions on the earth. The process of growth or enlargement will go on correspondingly in all of its parts; on the outside by falling meteors, the piling up of lava by volcanoes, and perhaps by many other as yet unknown causes.

As the outer crust of the earth accumulates on the surface, magnetic restraint becomes greater at the lava bed. Fervency follows and heat intensifies, causing the inner side of the outer crust to melt proportionally. So the crust will be kept at approximately the same thickness while constantly enlarging by accumulations.

The inner crust and the great interior cavity proportionately enlarge by cooling next the lava bed, as wastage of the interior surface goes on without accumulating; for no meteors fall there and no volcanoes there occur.

Forces and their material substances are there constantly given off, to escape through the polar vents, to assist in producing Aurora Borealis in the outer atmosphere and, by concretion of etherial substances, furnishing additional material to feed the planet for its further exterior increase in the solidifying process of plant and animal growth, decay and petrifaction. (Fig. A.)

This inner crust is an arching brace against the forces between it and the outer crust through which all the ruptures occur. The outer crust is not a bracing arch but is an expansive and even weaker form than if it were a flat surface.

This waning within and waxing without, of the two crusts respectively, is too gradual for observation by the inhabitants of either side; but millions of ages afford ample time for the most extensive changes; and our little satellite of the sun may, after billions of years, become an extra super-solar center of super-solar systems composed of suns, their planets and moons not yet in process of incubation.

The super-solar centers of now, may have passed on and become extra super-solar or defunct, so far as life on them is concerned, although they will still confer conditions of life on other worlds. Birth, growth and stages of evolution all globes must undergo; for neither time, nor space are lacking where all is infinite.

The moon must go through periods of disturbance as the earth has already gone and is going; and Earth will approach the present condition of our sun, which in turn will pass on to the more extensive career of super-solar, perhaps extra super-solar, beyond which it

will arrive at that stage where no rays will reach it from any other orb, to confer on it light, heat and life, although it will continue to confer these on the live and growing stars. It may also continue to confer life on inhabitants of its vast interior greatly augmented beyond its present capacity; and proportionately fitted for occupancy by beings of celestial character and exalted enjoyment.

All the stars that now exist have had their beginnings and may have their endings, as luminaries. As there is room enough in all space for any conceivable number of solar systems, so also there is time enough in which to pass through all the stages of birth, evolution and extinction any conceivable number of moons, planets and suns, if extinction be their fate.

If this globe has been in the moon's present condition and this moon will eventually come to the earth's present stage, the question arises as to the present condition of our planet. Its exterior is pretty well explored and its interior may be inferred by the great law of genesis and evolution already expounded on these pages. We are endowed with ability to discover law and perceive its uniformity of operation. By this we discern causes, determine their effects and comprehend existing relations between them. Yet we, by the weakness of credulity, are subjected to a belief in many preposterous errors and intimidated, by fear to renounce them, even when convinced of the truth. So great is this impediment in the way of our progress that but few surmount it; while many "die in their sins." Error is the source of sin. Ignorance is prolific of error. Hence the Bible

saying: "My people are destroyed for lack of knowledge." Persecution is a club in the hands of Cain, before whom the masses flee, while Abel falls under the inflicted blows. Yet, as generations pass away, virtue, the cause of envy, survives its would-be destroyer. Persecutors are finally extinguished while their victims are given life eternal. Martyrs live when their persecutors are forgotten.

The false belief that heat comes all the way from the sun has evoked many theories concerning the means by which that great luminary preserves its caloric. One thinks it is kept hot by the great weight of its own mass; another by the impact of meteors; and yet others announce the combustion theory; as if it could continue to burn for millions of ages without being consumed! From any rational point of view all these conjectures are preposterous. Earth is under the same influences as other stars; and we see the result. There is fire in the sun as well as in the earth, and from the same cause. Let us consider the earth and infer concerning the sun.

EARTH.

"Know, then, thyself. Presume not God to scan.
The proper study of mankind is man,"
And his own Earth. The stars thou canst not reach,
And more than thou canst learn this world will teach.

The interior of the earth is regarded as a molten mass, because volcanic eruptions have given us that indication; and also because deep excavations indicate that at a depth of twenty miles the ground must be red

hot, and at thirty miles a molten mass. If so, then at fifty miles it must be an incandescent gas. All this increase of heat is beyond the sun's influence and must be attributed to some other cause. Here again we have to meet a vast amount of scientific nonsense which the professional standing of its advocates renders very prejudicial and obstructive.

If the theory advanced in these pages be true—that magnetic restraint produces fervency manifested in heat —the rule must apply to Earth's interior; and our argument claims fair standing room. Light and heat are generated on the outer surface of any star or in its atmosphere by resistance to the magnetic rays from both itself and its chief luminary or central sun. But they are generated within or under the crust by magnetic passion *when restrained.* Magnetic restraint, accumulation and fervency, resulting in heat which increases as we descend, accounts for the molten condition of any star below the outer surface and beyond the reach of a sun's rays.

As by accretion on the surface Earth's crust becomes thicker, the process of melting takes place within, which causes a corresponding decrease of solid matter below, whereby the average thickness is maintained as enlargement of the entire sphere goes on. When by constant enlargement and thickening of the crust, restraint and resulting fervency becomes too great for endurance, vent is obtained by volcanic eruptions in which also steam plays an important part. These are usually accompanied by seismic disturbances, perhaps near the volcanic scene and perhaps many miles distant; caused

largely by gases which are constantly generated within the earth.

Besides this outer shell, which is being ruptured by volcanic action in various parts of the globe, there is also an inner crust but for which the outer one would not last a single day, nor could it have ever been formed. Let this inner crust now be removed, and, like an earthen basket, or vessel, containing an irresistible gas, the outer crust would be blown into fragments like an exploded bomb; or, if loaded with liquid lava, over 7,000 miles in diameter, it would not stand the surges of momentum caused by a single spiral turn so effective in producing oceanic tides. If accepted "scientific" theories were true, this fragile casket holding so enormous a quantity of molten lava, would be a seething cauldron of literal fire within a very brittle shell. Instead of being in such a dangerous predicament, we are safely standing and moving on an upper crust of a great earthen pie, spherical in shape, and well supported by bracements afforded in the contact of two crusts, at available positions where solidity gives to form its most effective strength. (D.)

This great inner ocean of molten matter between two crusts is the magnetic center of intense fervency from which heat, in both directions, decreases in the ratio of descending magnetic restraint, both outward and inward, until the surface without or within is reached, where all restraint ceases (except such restraint as the air furnishes), and comparatively free radiation begins. The surface within surrounds a great concavity which communicates with outer space by openings at the two

poles. The outer surface, on which we move, envelops the entire globe except the polar vents.

Of this double crust the inner one presents a convex surface to the intervening sea of lava, while the outer crust presents a concave surface. The inner crust therefore is a supporting arch against the liquid mass and consequently is not subject to eruptions like the outer crust. The latter more easily gives way because, although the constantly generating energies press alike on both, the effect of it is less inward than outward. So, volcanoes and earthquakes do not occur in the great cavity, because the outer shell is weaker and always yields to the common strain.

How deep this fiery ocean may be it is impossible to know; but as the magnetic restraint must be equal in both directions on account of its equal fusing effects under a given amount of resistance, it seems that the two crusts must be very nearly the same in thickness, unless the difference between convergence and divergence in the action of heat be considerable. As divergence eliminates energy transmitting or transferring it into outward effects, as explosion or expansion etc., while convergence accumulates energy or absorbs it from environing matter into that which is more immediately effected, or which is in the source of its action, so the restraint on inward rays is likely to result in force rather than its counterpart or interchangeable quality, heat. The inner crust, therefore, is probably thicker—perhaps much thicker than the outer crust.

Near the poles they unite; becoming one single crust which, although thicker than either of the two crusts,

is too thin to admit of an intervening lava bed. Consequently *there* is no internal fire; and as on the surface rays from the sun are chiefly horizontal, it is apparent why those zones are frigid and all conditions are unfavorable to prolific plant life. (Fig. D.)

With one solid crust at the poles, parting into two towards the equator where heat both within and without is most intense and extensive, the conditions of strength by bracement are most economically and amply supplied. Let the inner crust be removed and the whole interior filled with molten lava; then contemplate the effects of even a moderate quake. The theory of attraction would instantly vanish from any oracle, and overwhelm his thoughts of central gravity in complete and realistic oblivion.

Universal spacial force acting equally on the entire outer surface is resisted less at the poles than on the equator, from within where heat is generated. Hence, not only are eruptions mostly near the equator but earth's diameter is greater. The intervening lava bed is deeper; and it may be that the bulge of the inner crust is less; even so much less that, measured by it, the globe is longer from pole to pole than it is transversely through the equatorial center of the hollow inner sphere, and that the excess of equatorial diameter on the outer crust is more than counterbalanced by the excess of polar diameter within. Besides, the sun and moon are screens to stellar force acting on the tropical belt; and so permit the internal energy to act with more outward effect there than in the temperate and polar zones.

If each of the two crusts be fifty miles in thickness, and the intervening lava sea also be fifty miles deep at the equator, we then have a central cavity more than 7,500 miles across, through which magnetic rays from the great concave surface proceed and cross or focalize at the center where accumulation, resistance and intensity furnish all the requirements of a constant central *ideal* sun: not a sphere; presenting no disk; and although intangible and undefined; yet as bright, beautiful and real as a rainbow. (Figs. C and D.)

This also is likely to be the condition and effect of rays radiant from all directions in stellar space, focalizing on the earth and transmitted through it, meeting and crossing more intensely at the center than elsewhere; thus by coincidence aiding the earth's radiations in producing the focal aspect of terrestial, solar and celestial harmony.

They also pass in large portion across the great spacial sphere to the opposite side where they not only penetrate an atmosphere and meet a concave surface of earth, but also meet converging rays like themselves emitted from that surface, and on their journey to perform the same office on the opposite side of the etheric abyss.

Every inch of surface in the great concavity warmed by the nether heat, is fructified by convergent rays from its own and also the opposite side. Therefore it must be supplied with conditions most favorable to results even greater than those found in an equatorial belt on the outer crust, with such alterations and additions as are afforded by a sun always at zenith, and therefore constantly vertical, furnishing a perpetual noon-day-

light in an atmosphere which hugs the hollow surface of this concave world under conditions which, perhaps, are conducive to influences most favorable to exuberant life and unceasing happiness.

The atmosphere on earth's outer surface must be exceedingly rare at an elevation of twenty miles. If this be the case as near the surface of the great inner world or sphere, there are over 7,000 miles of comparatively atmospheric vacuum. So, all the needed varieties of weather for variegated life may be there. Clear sky and clouds, storms of rain, and possibly even of snow very near the polar vents, in alternate parts of the year; always at that pole which is in advance and hence dominantly electrical, more than at the rear pole which is dominantly magnetic and hence fervent. It is probable, however, that snow never falls in any portion of this great tropical cavity where there is a continual sun almost vertical to every portion of its area; but somewhat less because of elongation as the polar vents are approached where the crust is one or single, and therefore less in thickness from inner to outer side, than where it is double and greater in distance through the whole, midway between the polar vents and where two crusts and a lava sea make up the entire thickness between the inner and the outer world. This interior, therefore, may be elliptical in shape—elongated from pole to pole as above shown.

In its orbit around the outer sun the earth remains in the same general direction; but the two poles alternate in being before or behind in a to and fro manner as the circuit is traversed—each pole being ahead half of the

time. The forward pole or end is generally the coldest, but not abruptly so, as the change from one position to the other is gradual and almost imperceptible; the temperature being also graduated by influences which cannot be fully discussed in our abbreviated space, and in our ignorance of conditions.

No night within, although clouds, mists and beautiful rainbows may be there. Lightning and thunder may flash and reverberate among wooded hills and valleys, with flowing streams and lucid lakes abounding in aquatic life, while animate, floral and arborescent beauty occupy most lovely landscapes. Grandeur and magnificence inconceivable, without earthquakes, volcanoes, tornadoes or other terrors to mar delight, may reasonably be conjectured of conditions which reason and revelation combine to suggest of conditions in this delightful portion of our planet.

The all pervading ether of space without, must fill this cavity also; for it is transfused through the entire earth; and the outer and the inner space communicate and interchange their atmosphere by way of the great ventilating orifices at the poles. These orifices are so large that their size is not likely to be ascertained even if their borders are ever approached by a surmounting of the icy barriers that wall them about. (Fig. D.)

Were the earth viewed from a point in line with its polar axis [Fig. E], at a moderate distance away, as we now view the moon, the luminous interior might permit us with powerful telescopes to see clearly through it (were it not for the property of perspective which would apparently close the opposite pole) or, with eyes only,

behold a bright center of the disc which would have the appearance of a massive ring. For the same reason, and because of its great size, the sun, seen in the direction of its poles and from a distance near enough to be distinguishable, would seem a massive ring or as an enormous disk with a hole through its center.

Note how differently forces work on the exterior and interior. Without, all rays from the surface diverge, while opposite action works within. Here converging rays meet converging rays on every inch of surface and at all points athwart the vast abysmal realm; furnishing all the influences which on the external surface are erroneously attributed to attraction of gravitation. Within, the rays both given off and received are convergent and so endowed with greater potency. Effects are also modified by transmitted rays which come from without, passing through both crusts and the intervening lava. Interferences of reflection, refraction, transmission and emanation may not now be discussed. Their consideration belongs to a more complex analysis than is here intended. Let it suffice that objects within as well as without are held firmly to the earth, not by attraction but by cogent, POSITIVE action.

In this great interior we have, not only the rays converging from a concave surface—in action, the reverse of those diverging from a convex surface—but, what is equally important, instead of these rays being—like those from a convex surface—effective in proportion to their nearness to parallelism, they are more forcible in proportion as they are oblique and not parallel, but convergent. The more convergent, the more cogent and

effective. Hence their power increases with the decrease in the size of the circle from the inner surface of which they proceed. How great, then, must be this potency, if this cavity be comparatively small!

Whatever of centrifugal force there may be from the earth's rotation, operates on the inner and outer surfaces directly the reverse of each other. This tendency on the inner surface is to increase weight. The theory that everything on or in the earth tends towards the center, is true at all points outside the middle of the lava sea. Towards this neutral center line, or plane of energy, all objects tend from within as well as from without, and on the inner surface are more firmly held than on the outer.

From this beautiful summer sphere of eternal day we are barred by an impassable gulf. What is accomplished within by mortals more or less perfect than we, or haply by the immortal and invisible departed, we may not know on the outer portion of the planet. In future time, perhaps now very near, some genius may be sent who will solve the problem of etherial navigation, and thereby reach the polar vents, or one of them, and, may be, enter the great cavity within the inner crust of our planet.

It may not be very long until we shall scale the ramparts of ice and visit the abode of beings happy in the delights of continuous day where beauties excelling all we see on the outer mundane sphere delight senses vastly finer than ours. The ascent accomplished and the descent begun, suspicion might not enter the traveler's

mind that anything more than a milder climate is being entered on a polar plain or an open sea.

The physical vision, even when aided by art, is limited within a few miles of earthly observation, where objects are not either luminous or illuminated, and, across the polar aperture, are not visible because not lustrous. The great passage darkens as it deepens, until the sky and stars are vanished from view behind, while ahead the expanding orifice, counteracting perspective, opens to the delighted vision a distant view of the central sun.

Perhaps a telescope or even a field-glass might still disclose Polaris or some southern star; but not the dark walls of the enormous cavern, until hundreds of miles within its portals through gloom and peril, surrounded by crags and caverns of most forbidding aspect if approached on any side, the trepid navigator, uncertain of his course and under a play of unknown forces, fortuitously might experience terrible disaster; by head winds be driven back or capricious currents be impelled beyond the possibility, and perhaps beyond all desire, to return. What pranks gravity would play in such a passage is a subject for curious conjecture.

The journey may be long, rough and perilous, but the reward of endurance may also be ample for the most hazardous pilgrimage; if locality be a factor of our future existence.

This change from winter to summer and from a varying to constant day may be gradual. It might seem in some respects like a return to lower latitudes on the earth's exterior; until after days of toilsome journey-

ings through bewildering, strange and incomprehensible scenes, delights will surprise the traveler with aspects of surpassing loveliness, richer as we advance, excelling all that is left behind, until an awakening to full realization that earth's interior is being explored and Heaven is found.

Are the sparkling ices, abounding in rainbow hues, the pearly gates through which we may enter by lights auroral to that realm of a never-setting sun where joys do not cease?

When we point upward and away from this convex plane, the finger, like a magnetic ray outward, points divergently, locating Heaven in many different, and even in opposite directions, as we complete a circle in twenty-four hours; whereas, if we make its location in the beautiful country here mentioned, our point in its direction will be the same at any hour of the day or night or on any outer portion of the globe.

Which is the most consistent, rational, and therefore true idea of a distant paradise—so near although so far?

If our argument succeeds in reversing the order of beliefs, as in science new theories reverse old ones with reference to the rising and setting of sun and moon; and the views here expressed regarding these orbs as to their condition and career, while the cause of tides and weight, or gravity, is likewise reversed; and if the teachings in the nineteenth century that man is a "poor weak and unworthy worm of the dust" and made up of "poor miserable sinners" is now discovered to be erroneous and that God is not guilty of creating such a creature in "His own image;" thereby inaugurating a paradox; as man-

kind is now conceded to be His children, or at least may be by adoption; how is it not possible that Heaven should be in the direction opposite from that born of our conjectures or imaginings, and where exist conditions contrary from those of a supposed Hell?

Many beliefs in both science and religion have been changed and even reversed, only to be altered again and again without having reached a finality. What new reversals await further study and investigation we may not now apprehend; but this is no reason why we should not abandon any false belief and embrace a better one, always remaining ready to accept any change in the direction of HIGHER LIGHT.

The great law of energy, force, power and motion applies equally in the evolution of worlds and the mechanical movements of invented appliances by human brains. Nature and Art are under the same inevitable and unchanging law. This law holds good, and sways in the movements of man and the march of civilization. Understanding this we recognize a great plan in the course of empire and are able to forsee the destinies of countries, communities and nations. Do you long for such foresight concerning this country?

THEN READ

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A new accurate science. A new standard work.

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Astromony aims at the order of action;
Believing in force but opposing attraction.
Cosmonics considers all cause in creation;
Divining results by a just estimation;
Existence and energy, most comprehensive,
Forecasting the facts with effects most extensive.
Genetics, which gives us the law of beginnings,
Has ref'rence to growth and to all forms of "innings,"
In every department of Earth's evolution;
Joint interest with every star's constitution.
Knowledge is power and the surest foundation;
Love is the fruitage through faith's procreation.
Mystery shrouds every phase of existence;
Nothing's more sure than the law of resistance
Overcome by an impulse behind every motion,
Propelling the waves which, in ether's vast ocean,
Quake planets and atoms alike in their action;
Repulsion the mainspring; but never attraction.
Science succeeds when truth is its fountain;
Truth is a science which moves every mountain
Until, in the sunlight where freedom will flourish,
Virtue also can thrive and will purity nourish.
Weight then will be known as the act of repulsion;
Xylography plain cannot show the revulsion
Your schools (with false logic and lessons of error)
Zero then will have reached, in a chill of grim terror.

COSMONOGRAPHS.

Existence is eternal; from no beginning to no ending it forever is. Non-existence is inconceivable and impossible.

Existences and creations, as individual entities, begin and end. They are constantly taking place and will forever so continue.

Cause is primal. It antecedes and underlies all sequence and every creation. It is behind and above all action.

Truth is inherent, universal and eternal. It never was created nor can it be annihilated. It is primal and coexistent with cause.

Every truth newly discovered or acquired, is an aid in the acquisition of more truth, and brings us nearer to the center of *all truth*.

Truth is essentially the same, always and everywhere; but it is various in expression and adaptation. Expressions are facts.

Facts are specific and limited. They lose in value. Truths and principles are universal and eternal. Hence they are better guides.

Facts are foundations of evidence in certain transactions and occurrences. Principles apply to all; they never lose in value.

Life, mathematics and music constitute the tripod of truth. Their expressions may be prevented, or obliterated; but not their principles.

Principle is co-existent with cause, is concomitant of truth, and cannot be created or destroyed. It never diminishes.

Principles, like truths and causes, are infinitely numerous as branches and are always in harmony with one universal cause.

Philosophy is founded on truth and principle, rather than on facts. Hence philosophy is a better light and guide than is experience.

Philosophy is a headlight; and affords the means of intelligent prediction—of looking forward with reliable certainty.

Philosophy is a radiant sun. It shines in all directions. Therefore it is a light on our future. It is the true horoscope.

Prophecy is true when consistent with philosophy. The true prophet is a wise philosopher and mirror of the Creator.

Experience is a reflective lamp, throwing its light backward, showing only our past. In forecast it is not a reliable guide.

Experiences are valuable as facts; but truths and principles are not dependent on experience. They are science.

Conditions mold and circumstances modify effects and results. They never alter truths and principles. They are auxiliary cause.

Foresight is a faculty of strongest desire, and of highest value in business; but it is not a common source of happiness.

Results are always effects, but effects are not always

results. Effects end when results are reached. Results are final.

Night reveals to us vastly more of the universe than is revealed by daylight. Darkness and silence are essential to study.

Science is always truth, but truth is not science until it enters the domain of knowledge. False theories are not science.

Knowledge is the foundation of all true faith which elevates and ennobles man. Faith not so founded is blind.

Wisdom is the right use of knowledge, and is the secret of salvation from both premature physical, and final spiritual death.

Faith is an essential force in human affairs; it is the life of enterprise and strength of government. Faith is more than belief.

Faith is concerning things which do not appear and which are made of the unseen. What we see are only expressions.

Love is the fruition of knowledge through faith; all are essential parts of the tree of life. There can be no love without faith.

Life inheres; and is continually exhered as a primary and ultimate element of existence. Life is positive. Death is negation.

Art is the soul of science, music of sound, mathematics of shape, philosophy of truth and idea of thought.

Mind is a collective name of all the faculties or elements of the soul acting in unison, forming conclusions. It is not an entity.

Mind, by thought, governs matter in motions; then why not in formations? It causes disease; also death. Why not life?

Almighty mind, by law, controls all forms of existence. May it not create them, and even create matter by thought?

Thought is normal to nature, elemental in life, and fundamental in creation. It is in proportion to intelligence. Thoughts are entities.

Thoughts develop and also diminish growths, both normal and abnormal. They produce and also destroy organisms.

Intelligence is essential to thought, commensurate with it, and a co-ordinate of existence. Hence it is not created. It is creative.

Ideas are the fruition of intelligence, primaries of ingenuity, princes among principles and monarchs of human action.

Cogitation is the development of concepts, or ideas, by thoughts, into conclusions, and perhaps into material entities.

Mentality is manifested only in materiality. That is, mind can be known only by form or motion produced in matter.

Form is not created, and only sometimes is expressed; then always by shape in matter. Form inheres in space before taking shape in matter.

Matter embodies thought which is thus materialized and manifested as a constituent and expression of existence in substance.

Expression, in whatever form, is manifested intellection, whether seen or heard, in movements or in sounds, as words.

Soul is the individual, of which body is the person and expression. Each is proved by its own distinctive qualities.

Thought exhausts and therefore transmutes matter, which it creates or finites. May it not be concretive substance?

Spirit or soul may be a condition or entity of matter too sublimated for human conception. Spirit is cosmic.

Spirit and matter may be different conditions of the same substance, as water differs from steam, or air from ether.

Law is uniform in operation and infinite in variety of execution. Law must be co-existent with life, which depends on it.

Co-existent life and law must have an element of uniformity in creative and almighty essence mentioned in many titles.

GOD eternal must have life eternal under law eternal. All three must be potencies uncreated, creative and everlasting.

Man is a manifestation of his Maker. If made in His image and likeness, then GOD, also, must be an identity.

Reason consists in such united action of the soul's faculties as compel a distinguishment between truth and error in accord with known premises.

Universe is unity in diversity—one in all, or everything under one law; as the tap-root of a tree comprises all its branches. It is cosmonistic.

Trees are types of the universe and expressions of the great law of one in all as well as all in one,—unity in diversity. They are cosmonisms.

Ideas are born naked, often long before they are clothed or carried by words, or a market is found for their exchange.

Words, like other forms, express the thoughts which create them. They clothe ideas and carry them to market. Language is cosmical.

Qualities pertain only to existences. There are many qualities not known in matter. They must qualify something. May not that something be soul?

Inspiration is in accord with science. Both coincide with truth. Hence these are practically one, and cosmonistical.

Divine inspiration must be scientific. Scientific inspiration cannot be other than divine. Divinity comprehends all truth. It is cosmonic.

Discoveries and inventions in the line of science may all be inspired, and hence may all be divine. They are cosmoniscient.

Accidents (if there be such) often eventuate in discoveries and inventions. Accidents may be a part of Divine purpose.

Progress is the law of nature and is in proportion to the control of mind over matter. Improvement is the rule.

Increase of knowledge conduces to growth of soul, freedom of thought and liberality of sentiment, with salvation.

A theory is established only when proved. All kindred phenomena are in evidence. If true it is practical.

Perfection is not possible to progressive beings, for

when perfection is attained progress ends. Man is imperfect and progressive.

Harmony is a condition of happiness and must agree with Nature. Health is a result of harmony with laws of nature.

Nature forever seeks but never maintains equilibrium. Her constant effort to restore it causes motion.

Energy evolved becomes force, and force restrained gives power which yields results called motion. This is the law of action.

Motion being essential in creation, is the normal state or mode of matter. Motion is a product; not a potency.

Restrained efforts to restore equilibrium produce effects which, when observed, are called phenomena. They are cosmoscenic.

Suns and atoms obey the same law of energy, force, power and motion in continuous transition and evolution.

Magnetism is, in volume, proportioned to mass. In effect it is according to parallelism of rays. (Explanations herein.)

Rays proceed from convex and concave surfaces alike, but with opposite relative effects.

Effects of rays diminish as they proceed from convex surfaces. From concave surfaces they intensify or increase.

Rays proceed in direct lines perpendicular to surfaces from which they are impelled by pulsation or vibration.

Pulsation of atoms in any mass is most in direction of the surface (at right angles) because this is least resistant.

Radiation is vibration proceeding from all matter which is in constant pulsation or agitation. It is called radiant matter.

Concentrative is more potent than dispersive radiation when speed and volume are the same. Important truth.

Agitation or atomic tremor gives the introductory impulse to etheric motions in great variety; called vibrations.

Vibrations are quick, rapid, or intense, according to degree or kind of impulse to ether from atoms of matter in motion.

Atomic motions are slow or quick according to quality or kind of matter they compose, with effects according to speed.

Astronomy searches for principles while dealing with facts, real or supposed; resulting in many false deductions.

Astromony treats of truths, both known and inferred; with principles (not facts) as the bases of conclusions.

Cosmonics considers all causes and estimates all effects. All conditions and circumstances must agree in each result.

Potency is according to sublimation of substance and quickness of motion. Steam is more potent than water.

Air controls water and ether controls atmosphere. *This is the law.* The finer controls the coarser in the order of action.

If spirit be the highest form of existence, it follows, under the law, that spirit is the source of all energy and all action.

What poetry there is in lofty prose,
How prosy are the words of jingling rhyme;
In meditation let me find repose,
And in philosophy my dream sublime.

Be phrases always few and meanings deep;
With halo of the Infinite around;
Where boundless thought may roam in wid'ning sweep;
And only gems of simple truth are found.

PHYSICAL PROPHECY.

New Thought, New Theory, New Theme.

COSMONICS

OF THE

UNITED STATES.

A SUBLIME POEM IN SEVERE PROSE.

THIS REMARKABLE AND EXCEPTIONAL WORK

Is a comprehensive treatise on a composite subject embracing all the elements of strength to our union of states, extension of domain, growth of population, increase of wealth and augmentation of power. Whoever has not read it, misses a rare literary treat and lacks an adequate conception of the depth and fullness there is in

the meaning of Nature's provisions and promises in our behalf as an American commonwealth.

Possessing the charm (though not the form) of a high grade poem and fascinating as a first class novel [see Sartain's letter] this new, beautiful and useful science clothed in concise language illustrated with unique charts, or maps, indicating our traveling center of population towards its final rest at the junction of our commercial equator and meridian—a remarkable coincidence—in the great central region of our ultimate realm; and showing empire's line of march—its course across America in the path of power around the world; the whole being a compend of delineated lectures by the author; this Book is a civic searchlight on the entire situation, revealing a plan of civil evolution developed in concealment from remote antiquity and carried forward with undeviating unity of purpose to culminate on this continent where, from an eminence hitherto unreached, the reader surveys a scene of coming grandeur surpassing in reality anything recorded in the shadowy realms of romance.

It is a patriotic, economic, scientific looking forward; and, while unfolding a grand plot in creation and evolution, teaches a sublime philosophy in orderly statement (which is better than elaborate argument), and leads to logical deductions as conclusive as a solution in mathematics. It is a progressive presentation of the American problem presolved by rational rules and the unknown quantity found—the questionable future made so plain that it can be seen with a clearness and certainty almost equal to the eye of experience. It is a Physical

Prophecy founded in material conditions and existing circumstances verified in the harmony of history, geography, philosophy, living facts and all forces (formative influences on character and hence on community, country and civilization); a complete unity in establishing predictions and furnishing a substantial basis for correct estimates of America or any part of it in all relations of sections, states, cities or localities and lines of traffic and intercourse, each to any and all to every portion of the globe; a horoscope of our career and our destiny as a country, a people and a nation; a race and a republic.

This work is a digest and exponent of the newly discovered law governing migrations of men, the march of civilization and the course of empire to its goal in the central section on the northern half of the western hemisphere. It shows the positions, proportions, relations, contrasts and comparisons of continents and oceans; shores and slopes; lakes and rivers; mountains and plains. It gives positions, directions and relative distances by parallels and meridians of latitude and longitude; with many other features indicating law, plan and purpose in the order of natural arrangement. It is a fair, unprejudiced and impartial view; a full analysis of our national anatomy—our whole physical system—from the viewpoint of Nature.

It expounds THE HIGHER LAW; the unwritten—the natural—CONSTITUTION OF OUR COUNTRY, which was primary, is persistent and will prevail; to which all enactments must conform for unity, prosperity and peace. The natural antecedes, underlies and is

above the artificial—the written—constitution. It is peremptory. It cannot be annulled, abrogated nor evaded. Still more; it not only exacts obedience but indicates our future as a factor in the world's advancement. It is the true chart for all who man the ship of state which every one of the citizen crew should understand. It is the taproot of the tree of liberty and must be taught in the schools before our youth can comprehend or appreciate their inheritance; and until studied by our statesmen this country will be deficient in laws befitting a progressive people and succeeding generations.

This Book has a business value far beyond its cost. It is a safe guide for enterprise, investment and speculation in real estate and for the establishment of institutions or the construction of thoroughfares. Instead of specializing points and lines of advantage it illuminates all with an effulgence possible only in the light of COSMONICS.

It is not made up of hypothetical conjectures nor metaphysical speculation; but of tangible ideas expressed in plain words. Nor is it composed of dry figures, dull statistics or tiresome details; but of great underlying causes, fundamental principles, essential truths profound yet simple and self-evident easily understood; and remembered much better than the old way of learning geography etc. This method is easier, quicker and more enduring because more philosophical and practical, concluding in ESTABLISHED LAW.

This happy combination of entertaining educational illustrated scientific business literature is a masterstroke

of convenience, economy and interest, not found in any other book. Besides its numerous maps, a frontispiece —"a thing of beauty"—A SYMBOL OF EMPIRE found in the aspects of Nature—together with its Poetic Delineation, is by many esteemed as alone worth all the cost of the book. It is of superlative design, exquisite execution and marvelous meaning.

Every library should have this book and every American should own, read and study it for entertainment, instruction and profit in business as well as in culture and understanding. Price $2.00.

This Book has been read by more than thirty able critics, by request, for corrections and suggestions of improvement, before it was placed upon the market. Not one of them has indicated an error or emendation; but all have acknowledged its perfection and completeness. A few of their names are here given and some of their letters or extracts from letters are subjoined and will be read with interest. All were addressed to the author, O. M. Babcock, Chicago.

NAMES.

Prof. F. W. Putnam, Harvard University, Cambridge, Mass.

Hon. John Sartain, Author and United States Commissioner, Philadelphia, Pa.

Hon. Walter Q. Gresham, United States Judge and Secretary of State.

Hon. Lyman J. Gage, Bank President and Secretary of Treasury.

Hon. Thomas B. Bryan, First Vice-President Columbian Exposition, Chicago.

Hon. E. J. Searle, Colonel in Army and United States Judge, Rock Island.

Rev. H. W. Thomas, People's Church, Chicago.

Rev. H. W. Bolton, Methodist Episcopal Church, Chicago.

Rev. Samuel Fallows, Protestant Episcopal Church, Chicago.

Hon. David H. Mason, Editor and Historian, Chicago.

LETTERS.

From L. F. COOK, Inventor of New Rapid Transit.

A great subject beautifully handled.

From Prof. F. W. PUTNAM, Harvard University.

I regard it as very patriotic, and exceedingly suggestive.

From THOMAS B. BRYAN, Vice-President World's Fair.

The entire work indicates thought and is calculated to awaken thought.

From LYMAN J. GAGE, Secretary United States Treasury.

I have read with interest and satisfaction "Cosmonics of the United States." It points out clearly the line of our future commercial development, and is an inspiring prophecy of the national greatness that awaits us if we are true to the principles on which our national life is founded.

From PAUL G. BIGGS, 103 N. Park Avenue, Chicago.

I congratulate you on the publishing of your book entitled "Cosmonics," for which I paid you two dollars. I am proud to be the possessor of it, and if I could not replace it I would not take one hundred dollars for it. As I am a Real Estate man I feel its value. It should be in the hands of every Real Estate dealer in the United States. In fact, no library should be thought complete without it.

From the Eminent Author, Promoter and Patron of Art,
JOHN SARTAIN, Philadelphia.

I was so charmed with your book on "Cosmonics" on first reading it, that I have just completed a second reading carefully, and not only with renewed pleasure, but with enlarged enlightenment. It is captivating as a first-class novel, and if the numerous novel readers would include your "Cosmonics" in their round of entertainment, it would raise them to a higher level of thought, and perhaps lead to a more profitable use of precious time.

From E. J. SEARLE, Army Officer, and U. S. Judge.

It is original, suggestive, comprehensive. It exhibits laborious research in the domain of facts, profound thought as to principles and causes, and these from accurate and practical judgment and conclusions. It leads us from undoubted data to sublime conceptions of this country; its unity, its power and wealth, its social status and the mighty part it is intended to play in the great theater of the world's action and progress. Herein consists its excellence. I would commend it to every American citizen, native and foreign-born, old and young.

From DR. H. W. THOMAS, of the People's Church, Chicago.

The events of nations and countries have been recorded by many authors, and often with tedious detail; but few have dealt with the underlying causes, or written from the higher standpoint of the philosophy of history. In this is the peculiar value of Prof. Babcock's "Cosmonics of the United States." Instead of telling what has happened, he begins by giving a solid basis of physical facts and reasons from which certain results have naturally followed, and others may as certainly be expected. As such it is a physical geography, a history and a prophecy, in which one may see the past, the present and the future of our great country in the most rational and practical light. There are more facts and solid sense in these three lectures than are often found in that number of volumes.

From J. B. LEAKE, LaSalle and Adams Streets.

In your "Cosmonics of the United States" you have done a good work. You have exhibited strong thought and thorough acquaintance with this great subject in having discussed it so successfully in three short lectures. A careful, thoughtful reading, will make an American a greater admirer of his own country; a better patriot. The highest encomium I can bestow on your effort I conceive to be in the suggestion that your lectures, with some revision to suit the purposes, might well be introduced into the curriculum of our schools and colleges.

From DAVID H. MASON. Tariff Historian.

I have read with much pleasure and instruction your book entitled "Cosmonics of the United States." In its pages you set before your readers a feast of reason. You conduct them into a new realm of investigation and discovery, and you lead them on to conclusions which supply the deepest, broadest, grandest foundation possible for American patriotism. Lovers of this land of the free must become still more devoted to it by reading your book, while those in whom the love of country is still a feeble sentiment, must feel it warming and expanding into a nobler appreciation of patriotic duty. Had I the power I would place your little volume in every public and school library, to the end that the young of both sexes might be brought into frequent contact with ideas so stimulant of patriotism.

From FRANCIS B. PEABODY, Financier.

I have read with great interest an early copy of your book entitled "Cosmonics of the United States." The subject of which it treats is one of vital importance to the present and future generations of Americans. You write with a fine command of language, with great vigor and earnestness, and no thoughtful person can read your book without his enthusiasm being stirred, his patriotism stimulated,

and his pride exalted by your glowing pictures of the greatness and power which are in store for our beloved country, and especially for its central field of population, production and distribution. Your conclusions will, I think, command the respect and assent of all who give to the subject a careful study. Your book will elevate the thoughts of young men and inspire them with noble ambitions. The work should be widely read, and its influence must needs be important in shaping the actions and career of men and communities.

From BISHOP FALLOWS.

Your theme is new, highly interesting, very instructive and intensely patriotic. Every true American should become familiar with it. The wave of patriotism which is now sweeping over our country renders your book and public lectures fitting educators for our young people.

From FERNANDO JONES, 1834 Prairie Avenue, Chicago.

I have read and reread your "Cosmonics of the United States" and cannot refrain from expressing to you my admiration of your philosophy and your effective treatment of the course of empire and its inevitable future destiny. Your work is a valuable contribution to the subject and will promote thought and discussion valuable to the public.

From President of Elgin Patriotic Memorial Association:

COL. JOHN S. WILCOX.

Of your recent lecture at Elgin I am quite free to say that I was intensely interested and edified. The topic was so novel and its treatment so earnest that to me it was very instructive and entertaining. I have said to many that they missed a rare treat. I would be highly gratified if I could induce the men and women of our country to give careful thought to the theme you present with such ability and patriotic fervor.

Price of Book, $2.00. Address, Morell Bailey, Philadelphia, or O. M. Babcock, Chicago.

EXTRACT.

From Campbell's Illustrated Journal, March, 1901:

"Oliver M. Babcock, the distinguished lecturer, author and scholar, is a resident of the city of Chicago. He has made a life study of the science of political economy, and is one of the highest authorities on the subject. 'The Higher Law,' a work of which he is the author, has established for him an international reputation."

MONOGRAPH.

Of Scotch and English ancestry, traceable to the eleventh century; the author of this and the preceding work dates his immediate family record from the colonial settlements of New England. His parents on both sides were intensely American.

A native of Otsego County, N. Y., and a western pioneer in early boyhood, thereby inured to rigid economy and severe toil, with scanty schooling where books were few and papers almost unknown; ambition for a larger life grew as years advanced and matured with his manhood.

Self-support, independent education, diversified pursuits, varied experience and extensive observation during thirty-five years of travel, research, and study of the most advanced theories, became factors in the production of new philosophies to be launched in due time on a waiting world.

A refugee from New Orleans at the outbreak of secession, he became an earnest advocate of the Union cause and gave many lectures, besides executing some valuable secret service. By his tact, vigilance and perseverance the Camp Douglas conspiracy was detected and exposed;

thereby saving Chicago and other cities from pillage, devastation and outrage. Success of the plot would have brought the Union forces from the South to protect their own homes, procrastinated the war at least another year and probably secured foreign recognition of the Confederate States as a government, by foreign powers. Defeat of the plot was not surpassed in importance by any act of the Civil war; or of the recent war with Spain. Documents verifying the statements above made are preserved for use at any time. A full account may be found in one edition of the previous work, which contains a supplement on Chicago. (See prospectus on the four preceding pages, 137, 138, 139 and 140 of this book.) Both subjects are given extensively in public illustrated lectures by the author.

On account of the author's lectures and writings his assistance has been sought for in many ways. He was a member of the Advisory Council in Science and Philosophy at the World's Congress, and lecturer in the Ethnological Gallery of the Columbian Exposition, in 1893, at Chicago, where his daily discourses on the course of empire and results of American discovery, elicited the admiration and applause of thousands, many of whom pronounced these talks and illustrative charts the most interesting exhibit of the entire World's Fair.

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